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**Hearing on U.S. Energy Problems and Goals in an
Uncertain World Oil Market**

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**Prepared Statement of
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**Lessons of the 1970s:
The Case Against a New Crusade for Energy In-
dependence**

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The National Energy Policy of the 1970s did more harm than good.

Before the Congress succumbs to any renewed yearning for a "National Energy Strategy" to serve as a moral substitute for war, it ought to take a hard, cold look at the energy policies of the 'Seventies. As a whole the massive intervention of the federal government during the Energy Crisis years did more harm than good, and the good that did emerge was often at an exorbitant cost to consumers and taxpayers. The failures stemmed from the false premise that real energy costs tend to rise instead of fall over the long term, an over-emphasis on oil and oil imports, and the assumption that public officials and panels of experts are more competent to pick future technical winners than risk-taking investors.

Successes were fewer but dramatic.

There have nevertheless been some real successes in energy policy in the last two decades. They were mostly instances in which public policy worked with rather than against fundamental economic forces, particularly the inexorable trend toward greater efficiency and lower costs. The engine of progress in energy supply and—we are soon to learn—efforts to preserve environmental quality are most effectively driven by the prospect of profit or loss, coordinated by markets and voluntary contracting, and disciplined by competition.

Notable achievements include NGPA,

The Natural Gas Policy Act of 1978 took the natural-gas industry through a frightful and costly detour on its way to becoming a progressive part of the market economy. The ultimate destiny of the NGPA, however, was to free the production and bulk marketing of gas from the embrace of government-sponsored pipeline monopolies as well as from the crippling burden of direct price regulation. The results have included not only a tenfold reduction in primary commodity costs but dramatic advances in reliability, efficiency, and market-responsiveness of the continental gas-transport system.

PURPA

The Public Utility Regulatory Policies Act initiated a similar process in the electrical sector, recognizing electricity generation as a potentially competitive activity, distinguishable from the traditional "natural monopoly" organization of electrical distribution facilities. PURPA for the first time encouraged federal and state regulators to substitute "least-cost" for "cost-plus" as the norm for utility resource-acquisition. The electrical industry still lags several years behind natural gas, however, in the acceptance of competition in the producing (generation) sector, open access to transmission, and the adoption of rate structures and other regulatory incentives to economic efficiency. This is a major zone of unfinished business for public policy in the 1990s.

Energy-efficiency standards, including CAFE, and reductions in harmful discharges and emissions.

Other notable successes of the last two decades include quantum improvements in energy efficiency for appliances, new construction, and transportation, and dramatic reductions in harmful discharges and emissions per unit of useful energy produced or consumed.

This progress owes much to the inherent thrust of technology toward greater efficiency in energy production, conversion, and use, which directly implies reductions in discharges and emissions of waste materials and energy.

It is a falsehood that progress toward energy efficiency came to a halt during the 'Eighties, or that the United States has a particularly poor record in this respect. Accomplishments have come more slowly than necessary, however, and at greater cost relative to the progress made because of the failure to focus sharply on social objectives, and a preference for command and control mechanisms over economic incentives. But the Clean Air Act has made economic rationality respectable as a mechanism for environmental protection. An effective defense of the planet will require the full mobilization of those institutions of liberal capitalism that have proved so successful in the production of commodities.

But that is a subject for another day.

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**Lessons of the 1970s:
The Case Against a New Crusade
for Energy Independence**

(With apologies to David A. Stockman for imitating the title of his insightful and prophetic article, "The Wrong War? The Case Against a National Energy Policy," in The Public Interest, Fall 1978.)

War in the Middle East and the nostalgia for a National Energy Policy

War in the Middle East has beguiled America's columnists, consultants, and elected officials with nostalgia for the energy-conscious 1970s and a longing for a revived National Energy Policy (or "Strategy") to serve as a moral substitute for war. Before the Congress succumbs to any such yearning, it ought to take a hard, cold look at the energy policies of the 'Seventies as they really were, the premises that were used to rationalize them, and their actual results.

Federal energy initiatives in the Seventies did more harm than good.

Petroleum price controls and allocation; entitlements and the small-refiner bias.

As a whole, the massive intervention of the federal government during the Energy Crisis years did more harm than good, and the good that did emerge was often at an exorbitant cost to consumers or taxpayers.

For those who have forgotten or never knew, the centerpiece of national energy policy was a system of price controls and rationing for domestic crude oil and petroleum products. It was these made-in-Washington controls and not the Arab oil embargo of 1973, the Iranian revolution of 1979, or any collective action by OPEC, which spawned the gasoline lines and other distortions that symbolize crisis and shortage.

Pricing and allocation regulations subsidized imports of OPEC oil, depressed domestic production, and muted incentives for energy conservation. They wreaked mischief in countless other big and little ways that now seem hardly conceivable. From the billions of dollars of "entitlement" payments shuffled among the big oil companies to equalize their regulated crude-oil costs, for example, hundreds of millions were skimmed off by Congressional directive to subsidize the construction of an army of unneeded, inefficient, and

environmentally primitive little refineries, which were promptly abandoned when controls were removed in 1981.

R&D white elephants: the fast breeder, synthetic oil and gas.

The federal megabucks appropriated in the 1970s for research and development in "energy alternatives" were channeled mainly to white elephants like the fast breeder reactor and synthetic oil and gas plants. These monstrosities, along with a host of lesser technologies favored with tax benefits or R&D grants, required subsidies precisely because their sponsors in Congress and the Executive Branch knew they might not have a market, might not ever work, or failed honest tests of cost-effectiveness.

The cost of prolonged, partial natural-gas deregulation.

The wisest and most beneficial energy initiative of the Congress during those years was the deregulation of natural-gas prices. But the Natural Gas Policy Act of 1978 dragged out the decontrol process into a seven-year interregnum during which the gas industry labored under an even more tangled scheme of regulated prices. Between 1979 and 1985, partial decontrol under the NGPA created misleading price signals and perverse incentives in every part of the industry, effectively ruined most of the independent producing sector, and brought the interstate pipelines to the brink of bankruptcy. In the early 1990s, a big chunk of the resulting losses and litigation still remains to be disposed of.

The Fuels Use Act.

The most perverse of all the wrong-headed energy policies of the 1970s was probably the NGPA's companion legislation, the Powerplant and Industrial Fuels Use Act ["FUA"]. In the name of conservation, the FUA prohibited the use of natural gas, North America's most abundant, cheapest, and most environmentally benign fossil fuel, for the generation of electricity in new powerplants. Electric utilities were thus encouraged—indeed condemned—to meet their need for new capacity with custom-built nuclear- and coal-fired steam engines. These dinosaurs are ten times as big, cost ten times as much per unit of capacity, and take five times as long to build as the standardized, more reliable, and more efficient gas turbines and combined-cycle plants that would otherwise have been the industry's rational first choice. Despite the effective repeal of the FUA in 1987, the damage it did also remains to be fully reckoned and written off.

Knowing better than to repeat old errors is no insurance against embracing new ones.

The present clamor for a national energy policy is grounded in the same basic fallacies as President Nixon's campaign for Energy Independence and President Carter's NEP.

1. the illusion of growing energy scarcity;
2. the vanity of public servants, elected officials, and anointed "experts" that they have a

better than average ability to forecast cost and price trends, and to pick the "winners" among new products and technologies; and

3. an exaggerated preoccupation with the strategic importance of crude-oil supply in general and crude-oil imports in particular.

The energy-scarcity illusion.

The root misconception that nourished the errors of the 1970s was the notion that useful energy is a resource that must become scarcer and more costly over time. But energy is mankind's most abundant resource, and is available for human use in an unlimited number of forms. There is no inherent national or global need for oil, gas, coal, or any particular form of primary energy. People are ultimately interested only in supplying themselves with light, heat, motive power, and the little hydrocarbon molecules that serve as building blocks for more complex organic chemicals. Civilization already has a vast menu of options for serving these needs, and chooses each primary fuel or delivery system only for those applications, and only where and when it is the cheapest (or most effective at a given price). For so long as progressive market economies have coexisted with cultures that engaged in scientific inquiry and permitted economic rewards to innovation, mankind's menu of options has expanded and the choices it preferred on that menu have constantly shifted.

High-cost "alternatives" are always bad gambles.

The long-term course of useful energy costs (adjusted for inflation) at the point of consumption has sloped downward in the past, tilts downward today, and will remain pointed downward toward the future. Subsidies or regulations intended to promote or "jump-start" energy resources or forms that need such aid precisely because their costs exceed current price levels will always be bad gambles, because it is virtually certain that their economic handicap will widen over time. It is no accident, for example, that federal efforts to commercialize shale oil over a span of eighty years, and the thirty years of attempts to build a fast breeder reactor, have come to nothing.

Viable alternatives don't need subsidies or guaranteed markets.

New resource stocks and new methods of converting, transmitting, or using energy which promise to be viable in the future—cheaper, more efficient, or otherwise superior—do not need government R&D grants, tax incentives, regulatory compulsions, or guaranteed markets.

No such motivations would have been needed, for example, to expedite the choice of smaller, cleaner, lower-cost, more efficient, and more reliable gas-fired combustion turbines for electrical generation, instead of obsolete, oversized and overpriced nuclear and coal-fired steam plants. What was (and remains) necessary, however, was (and is) to remove the regulatory inhibitions on such choices, loosen the monopoly status granted to utility companies in electricity generation, and modify regulatory practices such as rate-base and rolled-in pricing that distort ratepayer consumption decisions and utility invest-

ment choices.

Today, domestic natural gas prices are equivalent to oil prices of about \$7.00 per barrel at the wellhead, and gasoline at 40 or 50 cents per gallon delivered to commercial end users. Such a market contains plenty of financial incentive to begin the substitution of compressed natural gas as motor fuel—unless that shift has real undiscovered flaws—without burdening the economy with a tax designed to lift oil prices from (say) \$16 to \$25 per barrel.

The conceit that public officials or expert panels have special insight and foresight for picking winners.

There need be no harm if Committees of Congress hold oversight or informational hearings, or if the DOE or the National Academy of Sciences sponsors studies, regarding the progress of horizontal drilling or photovoltaics, the prospects for abiotic gas or fuel cells, or problems in commercializing CNG-powered vehicles. Delegating to such expert panels the real-world choices among fuels, technologies, or projects is a strategy, however, that is utterly without support in the experience of the last two decades. Over this period, the record of energy agencies, trade associations, and experts of any kind in forecasting supply and price trends, or in selecting the winners from any given menu of competing technologies or projects, has been a continuous chain of disasters. The expert inputs to decision-making in the energy sector have been worse than random, and their impact via government action has clearly made the decisions taken worse on the average than they would have been in the absence of such inputs.

Forecasting performance: the example of natural-gas prices.

Let me focus on an instance that can be traced in the records of this Subcommittee over the last decade. In 1981, Representatives Sharp and Udall presided over hearings on the Alaska Natural Gas Transportation System. One consulting organization, representing a large and credible consortium of energy companies, offered in its testimony a survey of opinions from 28 "nationally recognized energy experts" regarding future energy prices. The weighted average of expert opinion in this survey implied a belief that the average economic value of Alaska natural gas, delivered into the existing Lower-48 gas-transmission network, would be \$11.79 per million btu in 1980 dollars over the life of the proposed \$40 billion pipeline. That would have been \$18.10 per million btu in 1990 dollars—just about one order of magnitude (ten times!) greater than the free-market price at which Lower-48 gas was actually selling in 1990.

It was forecasts like this that were being used to rationalize government action to push ANGTS which, fortunately, was one white elephant that never got completed. Much public and private money was, however, thrown away and many other foolish policies were adopted on the strength of similar forecasts by members of this particular panel of experts, the organizations they represented, and other advisors with which they were more-or-less interchangeable. By and large, these analysts are still respected as authorities on natural gas and are still giving advice that is still being acted upon, regarding private investments and public policy connected with energy.

Spectacular, stubborn expert incompetence did not end in the mid-1980s.

Year after year, and in each year since 1981, the overwhelming consensus among natural-gas experts and energy forecasters has been that there existed at the particular moment a temporary surplus of gas supply—the so-called "bubble"—which was due to disappear by the next heating season or perhaps the following one, if it was not already gone. Each year our pundits have repeated in unison that current prices were below "replacement cost". Next year and the following year, therefore, they predicted almost without exception that wellhead gas prices must rise substantially, and that they must thereafter continue rising at rates exceeding the rate of general inflation.

Look at the actual course of natural-gas prices in the United States, adjusted for inflation as depicted in figure 1. The recent price record has been one of unbroken stagnation or decline; the record of the recognized authorities in this field has thus been one of dramatic, unbroken error. How can the Congress in good conscience choose among alternative transport fuels, for example, and design cost-effective incentives, if the expert opinions on which these choices must rely are so irreparably flawed?

Choice of winners

Presently you may be faced with a vote to compel, directly or indirectly, the use of compressed natural-gas ["CNG"] to power some percentage of the nation's automobiles. I share the belief that use of CNG motor fuel is probably the most effective single means of improving air quality, without increasing the cost or reducing the quality of transportation available to Americans.

When the Members do vote on such a proposition, however, you might recall the lopsided votes in both Houses twelve years ago to ban forever the use of natural gas for generating electricity. Instead of comforting yourselves that, "We were mistaken then, but now we know how to Do the Right Thing," I hope that some will ask, instead, "Is this the really the kind of decision that Congress has any special competence to make?"

Preoccupation with oil imports

The driving source of error in the energy policies of the 1970s was a series of misconceptions about oil supply—its strategic importance, the nature of the economic and strategic risks associated with import dependence, and the effect that reducing oil imports can reasonably be expected to have on those risks. The same misinformation and fallacies dominate today's preoccupation with the nation's allegedly out-of-control dependence on oil imports.

The red herring of import dependence.

Firstly, the ratio of crude-oil imports to total crude-oil use is a red herring—a number that is meaningless as a measure of the nation's strategic or economic vulnerability. While net crude-oil imports to the United States increased from a low of 25 percent of total crude-oil supply in 1985 to 44 percent in 1990, Middle Eastern and North African OPEC sources accounted for only 16 percent of our total crude-oil supply.

Secondly, the U.S. is about 93 percent self-sufficient in natural gas, and more than 100-percent self-sufficient (that is, we are a net exporter) in coal. All petroleum imports accounted for only about 16 percent of total U.S. energy supply in BTU; while the Mideast and North Africa supplied only about 7 percent of the total. The cost of all oil imports and of Mideast and North African imports amounted to only 13 percent and 5 percent, respectively, of U.S. expenditures on fuels and energy in 1990.

Actual impacts of six Middle Eastern crises

There have been six major politically motivated interruptions of Mideastern crude-oil exports since the end of World War II, beginning in 1954 when Mossadeq nationalized the British oil concessions. In none of these incidents did a shortage of oil threaten the health, safety, or military security of any oil-importing nation. The only instances in which any of them suffered serious dislocations were those that the United States inflicted on itself during the crises of the 1970s.

The Middle Eastern supply interruptions of the 'Fifties and 'Sixties barely disturbed the level of world oil prices. The "oil shocks" of the 'Seventies were, however, essentially price disturbances—exacerbated and prolonged by the clumsy and counterproductive policies of the United States, which was home to most of the oil majors, and accounted for nearly one-third of the Free World's oil consumption. Price controls and rigid allocation rules in this country crippled the incentives and mechanisms by which the oil industry normally adjusts to the supply and demand shocks that are periodically generated by unexpected weather and such events as coal strikes and refinery or platform outages. It is not mere coincidence that world oil prices peaked and began their slide toward historical normalcy in early 1981, just when the United States abandoned petroleum price controls on domestic oil production and scuttled the "entitlements" subsidy for imports.

The biggest actual curtailment of production occurred in 1990, when both Kuwait and Iraq ceased exporting. That physical gap was filled within six weeks, however, without drawing on the Strategic Petroleum Reserves of the United States or other nations. Petroleum products prices (other than for jet fuel) failed to rise sufficiently to permit refiners to recover the higher cost of raw material; and impacts on natural-gas and coal prices were imperceptible. Despite a real shooting war in the Gulf, prices are lower today than they were the day before Iraq invaded Kuwait.

Most critically, however, the levels oil prices reached temporarily during the last three Middle Eastern crises never approached the high energy costs that policy makers were prepared to impose on the American people deliberately and permanently in the name of freedom from dependency on imported oil.

At bottom, the world wallows in a permanent surplus of oil-producing capacity. This reserve cushion is not shrinking, as the pessimists and alarmists would have us believe, but is bigger than ever before and still growing, both in absolute size and as a ratio to current production. (See Figure 2.)

There is almost nothing oil can do, moreover, that natural gas or coal can not do just as well at equivalent or lower costs with proved technology and hardware that is already available "off the shelf". One modest illustration of this capacity for substitution was the nearly 70-percent reduction in the use of heavy fuel oil by U.S. industry between 1978

and 1983, in response to the rise in oil prices over that period. Any one exporting country, any group of exporters, or even (say) every exporter in the Persian Gulf is thus totally dispensable, given a finite number of days or months to redeploy the global pattern of oil production, and even in the worst of conceivable scenarios, a very small number of years.

Can the U.S. avoid exposure?

One of the worst misconceptions about imports is the notion that reducing America's dependency ratio, even to zero, would have much effect on the vulnerability of the U.S. economy to oil-price shocks. The world oil market is truly global, and its fluctuations reverberate immediately to every country involved in world trade, without exception or favor. Britain and Canada are both net oil exporters, and thus have dependency ratios of less than zero. Consumers and oil-using industries in both countries experienced the same cost upheavals as their counterparts in the United States, which depends on imports for about half its oil supply, or even Japan and Germany, which depend on imports for nearly 100 percent of their oil.

What was the Gulf War about?

The Gulf War, and the need for decisive action to contain Iraq's aggression, were not about America's need for Middle Eastern oil, much less for the purpose of defending U.S. investments in Kuwaiti or Saudi Arabian oil wells (which investments are trivial). Firstly, they reflected the economic vulnerability of the whole world's economy, of which the United States is an inseparable part, to oil-market disorders. Even more importantly, they stemmed from the ability that oil revenues has given tyrants like those of Iran and Iraq to stuff themselves with high-technology armaments in pursuit of dynastic or doctrinal fancies, abetted by cold-war rivalries and the commercial greed of arms-exporting nations, not excepting the United States.

It is not a rational response to the risk of military disorder in the Middle East to cripple our own economy with the high costs of a new Crusade for Energy Independence. The remedy is, instead, a direct one—to join with the European Community, the successors to the Soviet Empire (whoever they turn out to be), and our allies in the region, to cut off the supply of high-technology arms to Third World adventurers.

Policy successes were fewer but dramatic.

The real successes in energy policy in the last two decades were instances in which public policy worked with rather than against fundamental economic forces, particularly the inexorable trend toward greater efficiency and lower costs.

The engine of progress in energy supply and—we are soon to learn—efforts to preserve environmental quality are most effectively driven by the prospect of profit or loss, coordinated by markets and voluntary contracting, and disciplined by competition.

Notable achievements include NGPA

The Natural Gas Policy Act of 1978 took the natural-gas industry through a frightful and costly detour on its way to becoming a progressive part of the market economy. The ul-

timate destiny of the NGPA, however, was to free the production and bulk marketing of gas from the embrace of government-sponsored pipeline monopolies as well as from the crippling burden of direct price regulation. The results have included not only a tenfold reduction in primary commodity costs but dramatic advances in reliability, efficiency, and market-responsiveness of the continental gas-transport system.

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Energy-efficiency and reductions in harmful discharges and emissions.

Other notable successes of the last two decades include quantum improvements in energy efficiency for appliances, new construction, and transportation, and dramatic reductions in harmful discharges and emissions per unit of useful energy produced or consumed. This progress owes much to the inherent thrust of technology toward greater efficiency in energy production, conversion, and use, which directly implies reductions in discharges and emissions of waste materials and energy.

It is a falsehood that progress toward energy efficiency came to a halt during the 'Eighties, or that the United States has a particularly poor record in this respect. Accomplishments have come more slowly than necessary, and at greater cost relative to the progress made however, because of the failure to focus sharply on social objectives, and a preference for command and control mechanisms over economic incentives. But the Clean Air Act has made economic rationality respectable as a mechanism for environmental protection. An effective defense of the planet will require the full mobilization of those institutions of liberal capitalism that have proved so successful in the production of commodities.

But that is a subject for another day.

The three big superstitions of the 1970s that leave the public and Congress vulnerable to swindles.

The public and particularly the Congress must develop a healthy skepticism about the illusion of scarcity, the conceit of special insight, and exaggeration of the risks that stem from oil imports. Otherwise, virtually any boondoggle that fails a market test today is bound to be rationalized once more by reference to predictions of higher price levels in the future, and by the barrels of imported oil it will allegedly displace. The Congress will

thus remain intellectually and politically defenseless against the special pleading of private promoters and the clamor of constituents who hope to benefit from some project, program or regulation; agency officials seeking to justify expanded missions, budgets and authority; and their respective armies of "expert" groupies and camp-followers.

Numbers are lost for following footnotes.

For a full exposition of the reasons the real costs of energy can be expected to continue falling, see Arlon R. Tussing and Samuel A. Van Vactor, "Prospective on World Energy Prices," *The OPEC Review*, August 1990.

House of Representatives, Committee on Energy and Commerce, Subcommittee on Fossil and Synthetic Fuels, and Committee on Interior and Insular Affairs, Subcommittee on Energy and the Environment, Joint Hearings on H.J. Res. 341, Providing for a Waiver of Law Pursuant to the Alaska Natural Gas Transportation Act. (October 30, November 4 and 9, 1981, p. 390). The list of experts is found at p. 391.

Testimony by another prominent expert calculated the 1990 economic value of natural gas on the basis of "least-unlikely" and "lower-bound" refinery costs of crude oil of \$66.42 and \$42.01 per barrel in 1980 dollars—\$101.95 and \$64.48, respectively, in 1990 dollars. (at p. 300)

In barrels. Total oil imports, including imports of petroleum products were about 47 percent of total U.S. petroleum supply. Mideast and North African OPEC sources (Arab OPEC plus Iran) provided about 48 percent of our total petroleum demand, in barrels.

Some specific proposals for working with, rather than against, the forces of technology and the market, are outlined in my testimony for this subcommittee shortly after the 1986 oil-price crash.

See "The World Oil Market Outlook and United States Energy Policies." Prepared testimony before the United States House of Representatives, Committee on Energy and Commerce, Subcommittee on Fossil and Synthetic Fuels, March 1986.

For a discussion of unfinished business in U.S. natural-gas policy, see *The Tasks of Public Policy With Respect to Natural Gas: Completing the Transition to Competitive Markets*, prepared testimony before the United States Senate Committee on Environment and Natural Resources, Subcommittee on Mineral Resources Development and Production, Washington, September 26, 1989.

Specific recommendations I have made to these ends can be found in *Economic Strategies for Energy and the Environment in California*. Prepared testimony of Arlon R. Tussing before the California Energy Commission, Sacramento, July 10, 1989, and "Use of Markets as Tools of Environmental Protection," in G. Bruce Doern (ed.), *The Environmental Imperative: Market Approaches to the Greening of Canada*. Paper presented at a conference on Environmental Policy and the Energy Industries in Alberta, January 18-19, 1990. Calgary. Toronto: C.D. Howe Institute, 1990.