The Heritage Foundation Backgrounder

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SECURING AMERICA'S ENERGY FUTURE: A PRIMER ON THE NATIONAL ENERGY STRATEGY

INTRODUCTION

After eighteen high-level hearings, and a review of 29,000 pages of written material and hundreds of proposals, the Energy Department earlier this year released its National Energy Strategy. Known as the NES, this is a wide-ranging list of particular recommendations for every type of energy and just about every energy issue.

The report comes at a time of much confusion about America's energy situation and the policies that will best guarantee America's energy security. For example, figures recently released by the Energy Department show the country's oil imports dropping by around 1 million barrels per day or 12 percent of the country's total use. While some observers might thus assume that there is no energy problem, in the long term America's energy needs will increase. More energy will have to be produced domestically or imported from overseas. In addition, Congress is considering a higher gas tax. Such a tax would increase costs for consumers and businesses, reducing American competitiveness and lowering American living standards. At the levels of taxes being discussed, perhaps ten cents per gallon, oil consumption would not be significantly reduced. A tax of, say, 50 cents per gallon would reduce consumption dramatically — by bringing the American economy to a halt. This is hardly a result acceptable to most policy makers.

Sound Recommendations. On the whole, the report is well balanced and its recommendations sound. Its major dual message is the need to reduce or eliminate government regulations that discourage energy production and the need to free entrepreneurs to meet America's energy needs.

As important as what the NES does, however, is what the NES does not do. In particular, it avoids many of the disastrous errors of the 1970s, when the federal government believed that it could control America's energy supply and demand. The results of this are well known: soaring energy prices, block-long gas lines, and uncertainty about America's energy and economic future. To be sure, there are shortcomings. The NES does tend to call for government research in energy areas that might best be left to the private sector. And in some cases the report could be more emphatic about the need for market reforms. But if policy makers do follow the NES roadmap, in general they will be taking America down the path to energy security.

Among NES topics and recommendations:

Energy Production and Efficiency. To promote both production and efficiency, the NES suggests more deregulation of local electrical monopolies, strict market pricing for electricity, and federal government purchases of natural gas vehicles.

Domestic Oil. To increase the domestic oil supply, the NES recommends opening the Arctic National Wildlife Refuge and the Outer Continental Shelf to oil exploration.

Western Hemisphere Energy Security. To reduce America's reliance on oil from the politically unstable Middle East without raising costs to consumers, the NES emphasizes negotiating freer energy trade and investment in the Western Hemisphere.

Natural Gas. To make maximum use of this clean energy source, found in abundance in America, the NES suggests, among other things, deregulating pipeline construction and pricing and removing restrictions on imports and exports of natural gas.

Domestic Coal. To make better use of this resource, also found in abundance in America, the NES recommends a consistent and predictable, rather than arbitrary, application of environmental laws, using coal slurry pipelines and preventing the Environmental Protection Agency from mandating specific technology and production methods for coal plants.

Nuclear Energy. The NES points out that this is a safe, non-polluting energy source, and suggests research to develop better designs for nuclear plants, to reform licensing procedures, and to increase the potential sites for nuclear waste disposal.

Renewable Energy and Electricity. The NES recommends removing licensing restrictions on hydroelectric plants and continuing research into nuclear fusion.

A major NES failing is the scant attention that it gives some key issues. For one thing, tax policy needs an overhaul. While the NES suggests modest changes in the tax code, what is needed is a restoration of all those tax code pres-

sures dealing with the energy industry that Congress has eliminated since 1969.

For another thing, the NES should be more emphatic about developing a Western Hemisphere common market for energy to diversify supplies and reduce dependence on the Middle East.

These deficiencies, however, are dwarfed by the achievement of the NES in presenting, for the first time, a comprehensive review of America's energy situation and in offering many market-oriented proposals for America's future energy security.

The NES already is prompting action on Capitol Hill. On June 4 the Senate Energy Committee approved S.1220, the National Energy Security Act, cosponsored by Bennett Johnston, the Louisiana Democrat, and Malcolm Wallop, the Wyoming Republican. Essentially similar to the Bush Administration's NES, the bill faces an uncertain fate. Many amendments could be added to it that would make America less energy secure. The House of Representatives is working on its own version of a comprehensive energy bill.

The Free Market Acts. When Saddam Hussein overran Kuwait about a year ago, crude oil prices shot to record levels. Some lawmakers urged a return to the interventionist energy policies of the 1970s. The Bush Administration wisely resisted this. Although the Iraqi crisis reduced world crude oil production by 4.1 million barrels per day, roughly the same as the 1973 Arab oil boycott and 1979 Iranian oil embargo, thanks to the Bush Administration's response, the results were entirely different. In both 1973 and 1979, emergency government controls greatly aggravated the effects of the disruption. In 1990, the Administration allowed the market to operate freely. As a result, the oil price rise was brief, peaking last October. By this February oil prices fell to below prewar levels. There were no 1970s-style gas lines.

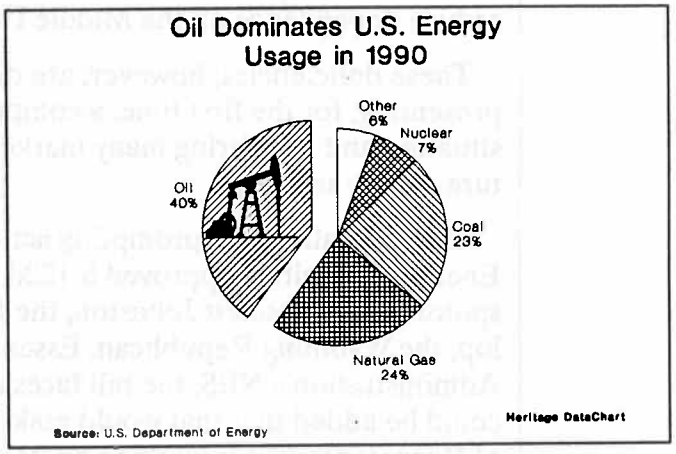
History demonstrates that the best government role in the energy sector is to assure that markets operate without hindrance. Markets, as even East European leaders now recognize, are the most efficient means of allocating resources. Yet federal government restrictions continue to impede the market's function in energy. Removing these obstacles deserves a high priority if America is to achieve energy security.

AMERICA'S ENERGY SITUATION

The United States is a country rich in energy. Domestic coal, natural gas, and oil are pillars of America's energy base. Still, current patterns of production and consumption will have to change in the future as known resources are exhausted.

Fossil fuels account for 89.2 percent of all energy used in the U.S. Oil is America's most important energy source. Last year, oil accounted for some 40 percent of American energy use. Next came natural gas, accounting for 24 percent of consumption, followed by coal at 23.3 percent. Nuclear energy contributed 7 percent of America's needs, with the rest coming from hydroelectric dams, and alternative energy sources.

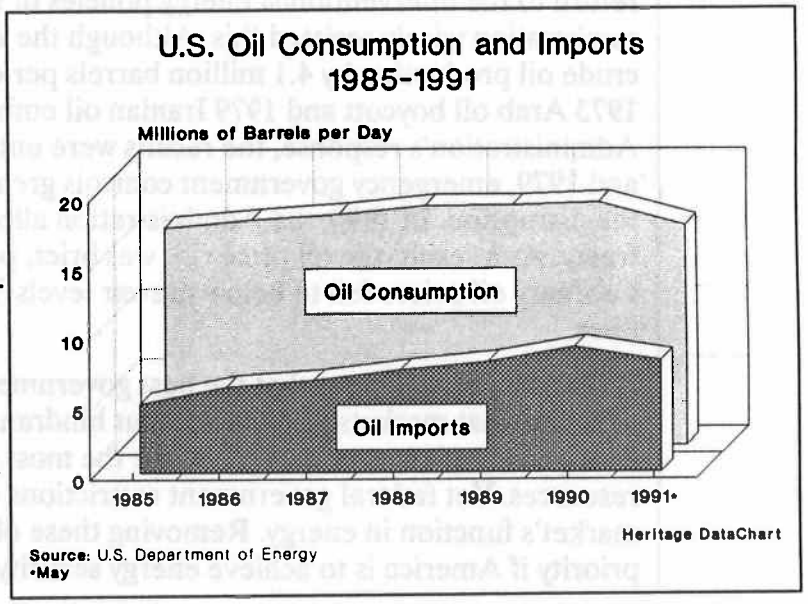
Chart 1



Even these figures, though, understate the importance of oil. Some 97 percent of all transportation energy comes from petroleum. While alternative fuels have made modest inroads in the transportation market, it will be a decade or more before they can offset oil consumption significantly.

This May, Americans used an average of 15,844,000 barrels per day (b/d) of oil, roughly one million less than in 1990. During this period, America's oil imports fell by 7.2 percent, from 8,649,000 b/d to 8,027,000 b/d. Still, America relies on foreign oil for more than half of its needs. More disturbing, America's oil production fell from around nine million b/d in 1985 to roughly 7.3 million b/d in 1990, a decline of almost 19 percent.

Chart 2



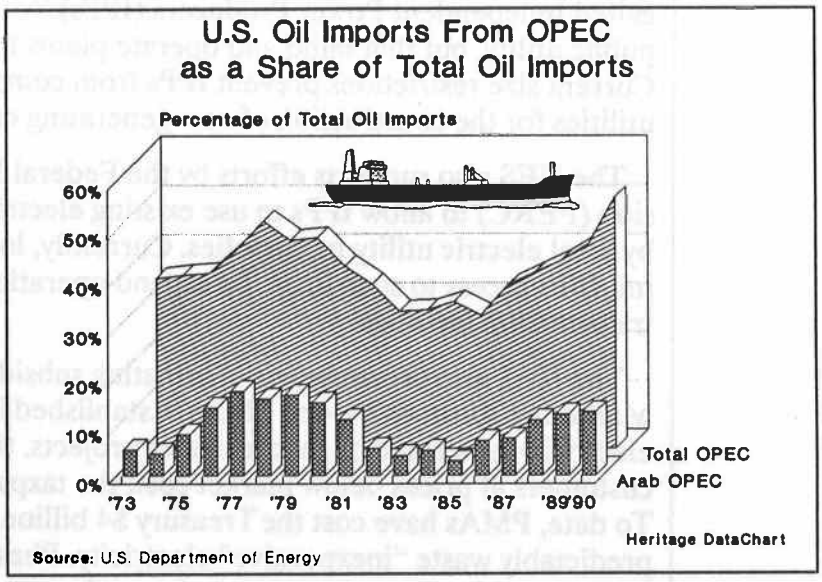
Though the Persian Gulf crisis spurred higher American oil output, the boost was small and as it turns out, temporary. Of more fundamental importance is the fact that America's "proved reserves" – essentially the oil that America has on the shelf – have declined by over 27 percent since the 1973 Arab oil embargo.

That America imports great quantities of oil is not, in itself, a problem. The real concern is whether the level of imports leaves America vulnerable to severe economic dislocation should foreign oil supplies suddenly be disrupted. This was the case in the 1970s, when two sudden and sharp price hikes rocked the American economy. When all factors are taken into account, the combined effects of the 1973 Arab oil embargo, and 1979 Iranian oil boycott cost America an astounding $1.5 trillion between 1974 and 1984.

And the 1970s oil shocks occurred when U.S. oil imports were far lower than they are today. America now imports over half its oil compared with 34.8 percent in 1973. Some 27 percent of imports, or 11.8 percent of American consumption, comes from the Persian Gulf, primarily from Saudi Arabia. The price hike that followed the invasion of Kuwait cost American consumers nearly $39 billion in higher oil prices.

To hedge against abrupt interruptions of oil supplies from abroad, the U.S. government maintains 587.5 million barrels of crude oil stored in its Strategic Petroleum Reserve (SPR). If all imports from all sources were cut off, the SPR would last about 75 days at current rates of consumption. Not much more oil could be obtained at short notice from American sources. The Energy Department estimates that even under the most favorable circumstances domestic oil production in the past year could have been increased by only about 100,000 b/d – and this would have taken about a year.

Chart 3



Thus security of supply is a fundamental consideration in American energy policy. This is recognized by NES. Its recommendations aim at a secure energy future achieved through market-based actions that improve efficiency, enhance security of supply, assure a clean environment, and fortify the foundations of America's energy economy.

INCREASING ENERGY AND ECONOMIC EFFICIENCY

The NES devotes 42 of its 189 pages to energy conservation, attained by boosting energy efficiency. While it is true that the document does not call for the sorts of mandates, regulations, and subsidies that were in favor during the 1970s, the dismal failure of those measures readily justifies their absence. Instead, the NES makes concrete suggestions for energy efficiency improvements for electricity generation, residential and commercial buildings use, industrial use, and transportation.

♦ ♦ Electricity

Most electricity is generated by utility companies, which are local monopolies closely regulated by state and federal authorities. This system stifles competition and is inefficient. The NES addresses these shortcomings by seeking increased competition within the electricity market. To do this, the NES proposes amending the 56-year-old Public Utility Holding Company Act to permit utilities to build, own, and operate power plants outside their traditional service area. The NES also would eliminate size restrictions on so-called Independent Power Producers (IPPs) — firms that are not part of a public utility, but that build and operate plants that sell electricity to utilities. Current size restrictions prevent IPPs from competing with traditional utilities for the construction of new generating capacity.

The NES also supports efforts by the Federal Energy Regulatory Commission (FERC) to allow IPPs to use existing electricity transmission lines owned by local electric utility monopolies. Currently, local monopolies need not permit IPPs access to such lines. To expand operations, IPPs must have access to transmission facilities.

The NES also recommends eliminating subsidies to the federal Power Marketing Authorities – or PMAs. Established in 1906 to distribute the electricity generated by federal water projects, the PMAs sell power to their customers at prices below market cost; the taxpayer absorbs the difference. To date, PMAs have cost the Treasury $4 billion. As a result, PMA customers predictably waste "inexpensive" electricity. Phasing out the huge subsidies to PMAs would encourage conservation and promote general economic efficiency, ending the waste of taxpayer dollars.

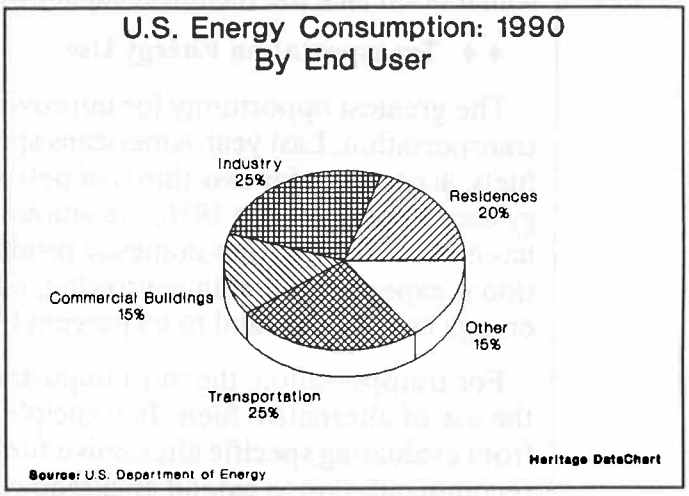
♦ ♦ Commercial and Residential Energy Efficiency

Residential use accounts for around 20 percent of American energy consumption. Each year, 90 million American households spend around $100 billion for heating, lighting, cooking, and other uses. Commercial buildings account for about 15 percent of total energy consumption, and about $70 billion in annual outlays.

Residential use of energy dropped by about one-third between 1962 and 1986 because of efficiency improvements in appliances, and investments by homeowners in energy-saving measures. Yet the use of the various kinds of

fuel consumed to generate power for homeowners increased as they shifted away from oil and coal for space heating and water heating. The fastest growing end users of primary energy, meanwhile, are commercial buildings, as a result of the spread of air-conditioning and the proliferation of computers, copiers, printers, and other office equipment.

Chart 4



A main obstacle identified by the NES to improving residential and commercial energy efficiency are government regulations that prevent energy prices from reflecting fully the real costs of generating the energy. Another obstacle is that government-owned housing is insulated from market forces and public housing authorities feel no competitive need to increase energy efficiency.

NES recommendations for commercial and residential energy mainly aim to spur research and development and education. The NES recognizes that conservation must be market-driven. One flaw in the NES recommendation, however, is the call for government efficiency standards for residences and commercial buildings. Mandating efficiency in buildings was attempted in the 1970s without success.

♦♦ Industrial Energy Efficiency

The industrial sector accounts for about one-quarter of American energy consumption. Industrial energy conservation as a response to market forces is one of the great success stories of the American energy economy. Between 1973 and 1989, the value of goods and services produced in America rose by 50 percent in real terms; the amount of energy required to produce these actually fell by 6 percent. Private industry reflexively responded to high energy prices by conserving energy.

The NES's primary recommendation to improve industrial energy efficiency is additional funding for research and development to help firms find new ways to use waste as a fuel. Yet industries already spend an estimated $46 billion annually for pollution control. Thus industry already has a strong financial incentive to find ways to use waste as a fuel. This is because the process of using waste products to generate energy consumes many pollutants. NES also recommends increased use of energy audits by industry. Such audits permit firms to identify areas in which they can reduce energy consumption and thus save money with existing technologies. The federal Department of Energy's

help in this is particularly important for small- and medium-sized firms, which often lack the technical capability to perform such audits themselves.

♦♦ Transportation Energy Use

The greatest opportunity for improving American energy efficiency is in transportation. Last year Americans spent $200 billion on transportation fuels, accounting for two-thirds of petroleum use and one-fourth of total energy consumption. Since 1976, the amount of oil consumed by transportation has exceeded American domestic production. Petroleum use for transportation is expected to continue growing, rising to more than 42 percent of total energy use by 2010, and to 66 percent by 2030.

For transportation, the most important NES recommendation encourages the use of alternative fuels. In principle this is sound. Yet the NES shies away from evaluating specific alternative fuels. The only exception is the NES recommendation to extend an already existing tax credit to oil companies for using ethanol. Because of this tax break, "gasohol," a blend of 10 percent ethanol/90 percent gasoline, accounts for about 10 percent of the gasoline supply. This means that ethanol is replacing about 1 percent of the gasoline, a very tiny amount. The NES should have evaluated the merits of alternative fuels. Had it done so, it probably would have concluded that natural gas is the most promising alternative.

FLEET CONVERSION TO NATURAL GAS

For America, natural gas is a good substitute for gasoline for transportation. First, America has an abundance of natural gas. Were it used in place of oil in all domestic fleet vehicles, current levels of consumption could be maintained for more than a half-century. Second, natural gas is clean burning and, as a gasoline substitute, would reduce air pollution.

Natural gas would be best suited as a gasoline substitute in fleet vehicles operated by a single owner such as a taxi company, a delivery service, or a local government. Although comprising 6.5 percent of the total vehicle population, fleet vehicles consume approximately 10 percent of all motor fuel. The $2,000 to $3,000 cost for converting an engine to burn natural gas is currently a deterrent to fleet use of this fuel. Were there greater demand, however, vehicles could be equipped at the factory to use natural gas. This would cut costs from 50 percent to 70 percent. Chrysler Corporation and General Motors plan to establish experimental production lines for alternative fueled cars and trucks. United Parcel Service and other firms are converting part of their fleets. Local governments too may want to buy natural gas vehicles to help meet air quality regulations. Even at the current prices, the cost of converting fleets to natural gas, the amount can be recovered in slightly over three years thanks to lower fuel and operating costs.

Fueling Federal Fleets. The NES wisely calls for more public education on the benefits of alternative fuel vehicles. Better still is the NES suggestion that

the federal government buy natural gas vehicles for its fleets. The federal government owns more than 200,000 motor vehicles, and in fiscal 1990 alone purchased 49,188 civilian vehicles. Federal purchases of natural gas vehicles would create enough demand to justify the mass production lines that significantly reduce costs.

This April 17, George Bush issued an Executive Order requiring federal agencies to purchase as many alternative-fuel vehicles as possible, and to compute cost/benefit ratios for the purchases on a "lifecycle costing" basis. This means that the total cost of owning and operating the vehicle over its useful life, rather than just its purchase price, will be how a vehicle's cost is reckoned.

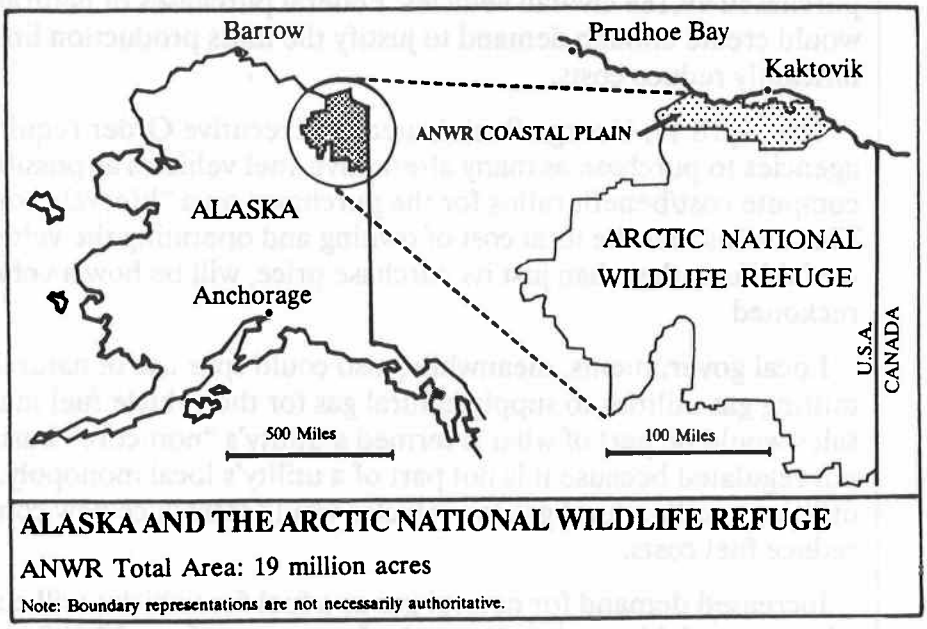
Local governments, meanwhile, also could spur use of natural gas by permitting gas utilities to supply natural gas for the vehicle fuel market. Such sales would be part of what is termed a utility's "non-core" business, which is not regulated because it is not part of a utility's local monopoly. Allowing utilities to sell natural gas for vehicles would introduce new competition and reduce fuel costs.

Increased demand for natural gas as a fuel for vehicles will cut the prices of all aspects of this market. Example: It now costs from $2,500 to $3,500 to buy a home compressor which can be attached to a residential natural gas line to fuel a natural gas vehicle. If mass-produced, the price could drop to under $1,000. A gas utility could install such a unit and recover its cost over, say, five years through fuel sales. As the number of natural gas vehicles increased, utilities could also install natural gas compressors at gasoline filling stations. Several already exist in the Washington, D.C., area. To do this, however, utilities must be allowed to sell natural gas fuel as a non-core business.

DOMESTIC OIL SECURITY

The principal problems addressed by the NES are the potential dangers to America's energy supplies. Oil is the most important component of the U.S. energy mix, accounting for 42 percent of all energy consumed and more than 97 percent of all transportation fuel. Last year Americans consumed an average of 17 million b/d. U.S. domestic production, however, has been falling, from just under 9 million b/d in 1985 to 7.3 million b/d in 1990. This is roughly 19 percent in domestic oil production. As a result, last year Americans paid some $55 billion for net oil imports. This figure could rise to $200 billion by 2010 according to Energy Department statistics. In the first half of the year oil imports actually fell by one million b/d, or about 12 percent of the total from the previous year. But this was due to factors other than a change in America's long-term energy production and consumption trends. First, due to uncertainty over the situation in the Persian Gulf, American oil companies drew on their own stored supplies and therefore required less imports. And second, the recession dampened oil consumption, thereby reducing some of the need for imported and domestically produced oil. The NES

recommends reducing U.S. vulnerability to oil "shocks" by encouraging increased domestic oil production.



ALASKA AND THE ARCTIC NATIONAL WILDLIFE REFUGE

ANWR Total Area: 19 million acres

Note: Boundary representations are not necessarily authoritative.

♦♦ The Arctic National Wildlife Refuge

The NES recommends opening the Arctic National Wildlife Refuge (ANWR) to oil exploration. Originally established in 1980 under Section 1002 of the Alaskan National Interest Lands Conservation Act, ANWR covers 19 million acres of Alaska's northernmost territory. About 8 percent of this area holds high promise for petroleum exploration. According to the Energy Department, it may contain more oil than Alaska's Prudhoe Bay, the largest North American oil field discovered to date.

Opponents of exploration in ANWR claim that development would harm wildlife. Yet more than a decade of experience at Prudhoe Bay, which steadily produces an average of 1.8 million b/d of oil, demonstrates that oil can be extracted in the Arctic without damaging the environment. The 1990 Exxon *Valdez* spill occurred because of deficiencies in the transportation system, not in drilling.

Oil output from production in Prudhoe Bay soon will begin declining. Unless ANWR is developed, output from Alaska will steadily fall. With ANWR, however, Alaska could keep pumping around 1.8 million b/d or even more. The NES conservatively estimates ANWR's potential output at 870,000 b/d by the year 2005. Oil from ANWR also would extend the life of the Prudhoe Bay field. This is because without ANWR, the volume of oil from Prudhoe Bay eventually will fall below the level required to operate the Trans-Alaska Pipeline.

♦♦ The Outer Continental Shelf

The NES also recommends expanded drilling for new oil on the Outer Continental Shelf (OCS), a portion of the Continental Plate extending underneath the ocean's surface. The OCS is believed to contain 7.5 billion barrels of oil and 9.4 trillion cubic feet of natural gas; this would be 26 percent of America's undiscovered oil and natural resources. The Reagan Administration proposed orderly development of OCS oil and gas resources in a way that would protect the environment. This was blocked by a series of lawsuits and congressional actions. Development of the OCS was further delayed when the Bush Administration halted leasing in several OCS areas including the coasts of California, Oregon, and Washington, the North Atlantic coast, and a portion of the Eastern Gulf of Mexico. This leaves only portions of the Gulf of Mexico and Mid and South Atlantic available for development. The freeze on new leases apparently remains in force for most of these areas until 1996, ostensibly to allow environmental and economic studies. Some OCS areas off California, however, will not be available for leasing until the year 2000.

Environmental concerns obviously are important. But so is American energy security. The two do not exclude each other. Technological advances in recent years have reduced significantly the chances of spills from offshore drilling. In fact, there have been no major spills at U.S. offshore facilities since 1969 when a well off the coast of Santa Barbara, California, blew out, fouling miles of beach. Safety measures developed as a result of this spill make a re-occurrence unlikely. Today, indeed, there is far less environmental risk from drilling offshore wells and transporting oil to shore by pipeline than there is from transporting oil from other nations by tankers.

The NES recommends that those areas in which leasing has been halted be considered for inclusion in a five-year leasing plan being drafted by the Department of the Interior. The NES also suggests that Congress ban none of the new areas under consideration for the five-year leasing plan until a study is completed that weighs resource potential and environmental effects of energy development.

♦♦ The Tax Problem

For more than two decades, unfavorable tax treatment of the oil industry has contributed significantly to the decline of American domestic oil production. Addressing this, the NES recommends some tax code changes. These would give somewhat more favorable tax treatment to so-called "marginal oil production." This is the output from wells that are nearly exhausted. The NES also calls for better tax treatment for "unconventional" natural gas production, such as that from coal seams.

In its proposed tax changes, the NES stops far short of what is needed to remove the tax code's penalties on domestic oil production. The oil industry is treated more harshly by the tax code than any other sector of the economy. Since 1969, for example, most oil producers have lost what is knowm as "the

depletion allowance." This is the accounting mechanism that recognizes that as oil is extracted from the ground, the oil company's capital is depleted – just as a manufacturing firm's capital would be depleted as machinery deteriorated. The depletion allowance for mineral development is the equivalent of depreciation for a manufacturing business. It is an allowance that is used as a deduction from taxable income. Loss of the depletion allowance of course drives up the cost of oil production in America.

Also driving up the cost is the 1976 law, enacted by Congress and approved by Gerald Ford, that imposes a minimum tax on what it called "intangible drilling costs." These typically are the costs of building roads to oil well sites, of the "muds" used to lubricate the rotating shaft of an oil rig, and of the energy used to operate the rig. Such costs from 1976 to last year were taxed at 10 percent of their value. Last year's tax hike package boosted this tax to 24 percent. The tiny tax credit given to the oil industry last year offers little real relief. Why drilling costs themselves should be taxed is, of course, the question. In every other industry these would be treated as normal business expenses to be deducted from revenues. Yet for oil drillers they are effectively treated as income.

Further adding to the burden on the oil industry is the 1980 special tax on oil companies to finance the Superfund, the federal program to clean hazardous waste sites. Other taxes harm the oil industry as well. Taxes on refined petroleum products were increased several times for such diverse reasons as to fund mass transit and help reduce the deficit. These taxes are imposed specifically on the oil industry; other industries do not pay them. A 1987 Energy Department report on energy security concludes that American oil production would be increased were the full depletion allowance restored. The report also calls for a 5 percent tax credit for oil exploration and development costs and for the removal of tax penalties on the industry. Taken together, these changes would add 1,233,000 b/d to domestic production within a decade. While the 1987 report also found that these changes would reduce Treasury revenues by $7.622 billion over roughly the same period, it failed to take into account the new revenues that would be received by the Treasury from wages paid to workers employed to develop the new oil, and from royalties on oil and gas produced on federal lands. With these new revenues, the Treasury would collect an extra $40 billion over the decade.

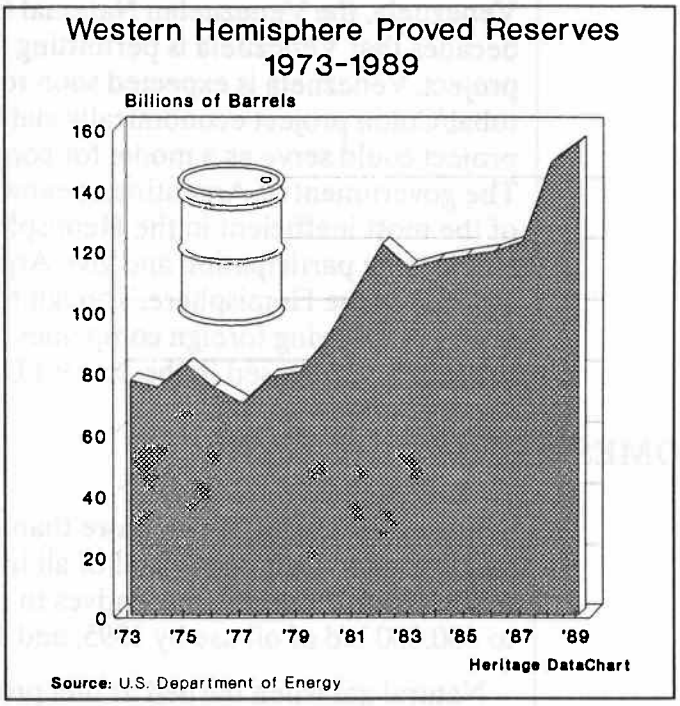
WESTERN HEMISPHERIC ENERGY SECURITY

The NES strongly supports developing non-Persian Gulf oil supplies. The NES specifically targets Eastern Europe and the Western Hemisphere for development. The NES also urges a review of U.S. laws to ensure they do not discourage energy development. If production outside the Persian Gulf is not encouraged, 41 percent of world oil supplies will come from that region by the year 2010. Known oil reserves outside the Persian Gulf total about 337 billion barrels; this is about half the 654 billion barrel reserve in the Persian Gulf.

The greatest opportunity for expanding secure production outside the Persian Gulf is in the Western Hemisphere. The nations of North and South America have proved oil reserves of over 156 billion barrels and natural gas reserves of over 518 trillion cubic feet. The hemisphere also has 30 percent of the world's coal reserves and 42 percent of its hydroelectric power capacity.

Latin American countries, of course, generally are more politically stable and friendlier to the U.S. than are Middle Eastern countries.

Chart 5



To increase use of the Western Hemisphere's energy resources, energy trade should be allowed to flow freely across the borders of all nations in the Americas through the creation of a common market for energy. The Western Hemisphere readily could meet its own energy needs, and even export energy. Latin America could produce as much as 3.5 million more b/d.

For Latin America, increased energy trade with the U.S. could help reduce the enormous Latin American foreign debt. For the U.S., increased reliance on hemispheric energy sources would improve energy security. To increase cooperation on energy trade within the hemisphere, a number of steps must be taken. One of the most important is the elimination of barriers to foreign investment common in Latin America.

The U.S. and Canada made a good start towards a hemispheric common market in energy with their 1988 Free Trade Area agreement. It provides for unrestricted oil and electricity trade across borders. Natural gas so far is not covered by the agreement, since it is highly regulated in both countries.

A key element to an energy free trade area would be the reduction and eventual elimination of laws, especially in Mexico and the Latin American countries, that prohibit foreign investment in resource development, or set confiscatory tax rates on profits from such investments.

♦♦ The Venezuelan Example

A promising development is the proposed Cristobal/Colon joint venture in Venezuela. The project involves the export of liquefied natural gas (LNG) from Venezuela to the U.S. The partners include Exxon Corporation, Royal

Dutch/Shell Group, Mitsubishi Corporation, and a subsidiary of Petroleos de Venezuela, the Venezuelan National Oil Company. This is the first time in decades that Venezuela is permitting foreign participation in an energy project. Venezuela is expected soon to revise its tax laws to make the Cristobal/Colon project economically viable. A successful Cristobal/Colon project could serve as a model for cooperation throughout the Hemisphere. The government of Argentina, meanwhile, is privatizing its oil industry, one of the most inefficient in the Hemisphere. This should increase production and foreign participation and give Argentina an incentive to seek freer energy trade in the Hemisphere. Though Mexico still resists privatizing its oil industry or allowing foreign companies to own equity shares in the industry, this will be addressed in the current U.S.-Mexico free trade area talks.

DOMESTIC NATURAL GAS

Natural gas accounts for more than one-fifth of America's primary energy, and is used to heat nearly half of all homes. The NES cites natural gas as one of the most promising alternatives to oil, suggesting that it could replace up to 600,000 b/d of oil use by 1995, and 1.7 million b/d by 2000.

Natural gas when burned as fuel produces less air pollution than oil or coal, and the technology to convert from oil to natural gas is well established. Most important, America has natural gas in vast quantities.

Natural gas competes directly with oil in the industrial boiler fuel market, with natural gas accounting for 37 percent and oil only 36 percent of all industrial energy used in 1989. Coal accounts for most of the balance. Virtually all of the oil burned in industrial boilers, or roughly 24.7 percent of total American oil consumption, could be replaced by natural gas. Many boilers are designed to use either fuel and can be switched back and forth in response to the relative price of the two fuels.

♦♦ Pipeline Construction Barriers

The NES finds that statutory and regulatory impediments are reducing American natural gas usage by 1 trillion cubic feet per year. This amount could displace 470,000 b/d of oil. In some cases, particularly in the Northeast, industrial boilers cannot use natural gas because there are no pipelines to deliver it. Pipeline construction often is stymied by a federal regulatory approval process which can take five times as long as it does for the actual pipeline to be built.

The cumbersome regulatory system was designed in the days when some pipeline firms enjoyed near monopoly power in some regions. Today, with over 1.3 million miles of pipeline and a choice of routes available in most cases, monopoly no longer is a problem. Yet the antiquated approval process remains, hurting rather than protecting the consumer. Reducing regulations would speed pipeline construction, significantly lower transportation costs, and make natural gas more attractive as a fuel.

The Federal Energy Regulatory Commission (FERC), the body that oversees approval of interstate natural gas pipelines and regulates their rates, recognizes the problem and is trying to reform its procedures administratively with the support of the Bush White House. The NES endorses this and suggests clarifying confusing provisions of the 1938 Natural Gas Policy Act. It recommends that pipeline companies be allowed to proceed without federal certification if they forego the right to exercise federal eminent domain in obtaining the private property needed for the pipeline. Under current regulations, federal certification of a pipeline entitles the pipeline company to invoke eminent domain.

♦♦ Natural Gas Pipeline Pricing

The price that natural gas pipelines charge for their services has been regulated by Washington since the Natural Gas Act of 1938. The NES calls for a reversal of this and for deregulation of pipeline prices so long as pipeline customers have access to alternative sources of energy supplies. Today, pipeline companies can refuse to transport natural gas for producers not affiliated with them. But because these companies usually enjoy a monopoly in their service areas, such refusals restrict competition. Requiring pipeline companies with local, government-supported monopolies to transport natural gas for other companies would improve competition.

The NES recommends reforming the pipeline rate structure to encourage efficient use. Current rules often force pipeline owners to charge higher prices for their services during periods of low use, to cover the pipeline costs even though demand is low. Conversely, during periods of peak use, pipeline owners are forced to underprice their services to avoid making profits higher than those allowed by the regulators. The NES suggests that FERC permit pipeline owners to sell their excess capacity during periods of low use, and to buy additional capacity from other pipelines during peak periods. This would help even out the pipeline transportation load and increase efficiency.

♦♦ Regulation of Gas Imports and Exports

Natural gas imports and exports are regulated by the Department of Energy. America last year imported about 8 percent of its natural gas, primarily from Canada. By the year 2000, American natural gas imports are expected to rise to around 12 percent of natural gas consumption, and by 2010 to 14 percent. The U.S exports a small amount of liquefied natural gas to Japan. Vast amounts of Alaskan natural gas could be sold to Japan were it not for the federal limits on exports. The NES recommends ending the Energy Department's authority over gas import and export transactions.

DOMESTIC COAL

Coal is America's most abundant fuel, accounting for 90 percent of American energy resources. Coal use has grown sharply in recent years. In 1970, for example, the U.S. consumed 523.2 million tons of coal, in 1980,

702.7 million tons, and in 1990, 894.6 million tons, accounting for 23 percent of American energy needs. By 2010, American coal use could rise to 1.6 billion tons. Coal also is a major export, with more than 100 million tons sold last year. Increased use of coal, however, could be hindered by the tightened environmental regulations in the Clean Air Act of 1990. The NES cites the Energy Department's Clean Coal Technology (CCT) program, initiated in 1986, as a way to permit increased coal use and still protect the environment. To accelerate the CCT program, the NES recommends reforming federal coal leasing policies, reforming regulations concerning coal mining safety and health, and encouraging greater use of coal slurry pipelines.

♦ ♦ Promoting Coal Production

The Clean Coal Technology Program aims at developing new technologies to burn coal cleaner, with less pollution. For the CCT to succeed, sufficient quantities of low-sulfur coal must be burned. Much of this type of coal is on federal land. The NES recommends that the Department of Interior's Federal Coal Leasing Program insure that adequate low-sulfur coal areas are offered for lease. At the same time, NES calls on the Bureau of Mines to continue research and development on technologies to address environmental concerns about underground coal mining. It also calls for continued tax credits for extracting the marketable methane gas found in the underground coal beds.

♦ ♦ Regulatory Reform

The NES stresses the need to eliminate the uncertainty about the kind of environmental regulations that are to be imposed under the 1977 Surface Mining Control and Reclamation Act. This act has been inconsistently applied. Reform is especially important to low-sulfur coal production, most of which is extracted from surface mines.

The NES also calls for performance-based standards for mine safety and health regulations. Adopting performance-based standards, where results, rather than specific federally-imposed methods, are used to measure compliance, will permit a more rapid introduction of technological improvements and improve worker safety.

♦ ♦ Coal Slurry Pipelines

Coal slurry pipelines, in which pulverized coal mixed with water is transported as a liquid, reduce coal transportation costs. Since almost all prospective slurry pipeline routes will cross over or under highways, rail lines, and other private property, slurry pipelines require that government exercise the right of eminent domain to obtain the right-of-way for the pipelines. This is done for right-of-way for electric wires, roads, and rails. Because slurry pipelines use large amounts of water, there has been great opposition to granting pipeline builders eminent domain in Western states where water is scarce. Yet large deposits of low-sulfur coal are in the West, and rail transport of the coal to Eastern markets is much more costly than transport by slurry

pipelines. The NES correctly supports granting eminent domain to slurry pipeline builders once all questions concerning water rights and usage have been satisfied.

♦ ♦ Clean Air Act Amendments

The Clean Air Act of 1990 mandates that annual emissions of sulfur dioxide in the U.S. by the year 2000 will be at least 10 million tons below the 1980 level. The act further decrees that the emissions level reached in the year 2000 will never be exceeded. The act requires existing coal-burning electric utility plants to install expensive devices to control emissions of nitrogen oxides.

These new requirements could seriously constrain American coal use. While accepting the clean air goal set by the 1990 act, the NES stresses that the goal can be met by accelerating the Clean Coal Technology Program. This would be much less costly to the economy than the devices called for by the Clean Air Act.

♦ ♦ The WEPCO Decision

When the first Clean Air Act was passed in 1970, most existing electrical generating plants were exempted from the new air quality rules. At the time it was assumed that existing plants soon would be replaced by new facilities that would be subject to the law. Yet, as the expense and difficulties associated with building new electrical generating plants increased, utilities typically decided to refurbish existing plants rather than build new ones. In 1988, a decision by the Environmental Protection Agency involving a plant refurbished by the Wisconsin Electric Power Company (WEPCO) held that when a utility makes "non-routine" changes in the operation, repair, or maintenance of a unit, the plant may become subject to air quality rules. This meant that the utility was required to install specific pollution control devices mandated by regulations.

Skyrocketing Cost. The effect of this decision on the WEPCO plant was enormous. The capital cost for refurbishment jumped from $80 million to $120 million. It became necessary to cut the plant's size from 400 megawatts to 320 megawatts. As a result, the cost of re-outfitting the WEPCO plant rose by 87.5 percent overall. Worse still, the EPA indicated that it will determine what constitutes a "non-routine" refurbishment case by case. As a result, utilities deciding how to meet future power requirements must assume that any refurbishment will fall under the WEPCO precedent.

The WEPCO decision illustrates the uncertainties that the inconsistent and unpredictable application of regulations can introduce into the market. The NES correctly suggests that the Energy Department work with the EPA to identify the areas of regulation that create planning uncertainties for electric utilities with older plants, and strive to make the revisions necessary to clarify them. A more basic question, however, as with the WEPCO decision, is whether the EPA will continue to resist performance-based standards for

public utilities. Unlike the more traditional command and control "cookbook" approach, such standards emphasize results. If EPA resists this approach, the Administration should take direct action against EPA to assure the adoption of such sound policy.

NUCLEAR POWER

Although nuclear plants generate around 20 percent of American electricity, for all practical purposes American nuclear energy development is at a standstill. Because of public opposition and excessive regulation, no new nuclear plants have been ordered in America since 1978; only three remain scheduled for construction. More than 100 orders have been cancelled or deferred.

Still, nuclear energy remains an attractive way to generate electricity. It is clean and relatively safe. America has huge deposits of uranium, the source of nuclear fuel. The NES estimates that America will need from 190 gigawatts to 275 gigawatts of new electrical generation capacity by the year 2010 (a gigawatt is one billion watts). Currently it takes two coal-fired plants or one nuclear plant to produce a gigawatt. Most of America's added energy will be generated by large, centralized plants, known as "base load generation." These are best suited to nuclear power.

To give nuclear energy a new chance, the NES addresses several important issues.

♦♦ Advanced Powerplant Designs

The accidents at the Three Mile Island nuclear facility in Pennsylvania in 1979 and at the Chernobyl facility in Ukraine in 1986 heightened public concern over plant safety. Since 1979, the Department of Energy has been researching advanced light-water reactors (ALWRs), which will be safer than current designs. By 1995, the ALWR design should be complete and a prototype could be operating by 2000. Other advanced designs are also being developed. Among the most promising is the Modular High-Temperature Gas Reactor. With it, if all external power systems were to fail, the reactor would simply shut itself down. The NES endorses these research and development efforts.

♦♦ Licensing Reform and Design Standardization

Delays encountered in licensing nuclear power plants long have been among the nuclear industry's greatest problems. The licensing process in America can take up to fifteen years compared to less than five years in Japan or France. Unlike other governments, Washington reserves key licensing approvals until after a plant is built. As a result, a utility can have a completed plant costing a billion dollars sitting idle because of a regulatory delay.

This process is complicated further by the tendency of electric utilities to order unique designs for each plant. This subjects each plant to its own ex-

haustive review process. In France and Japan, by contrast, it has long been the practice to use standardized models for nuclear plants. Besides reducing licensing delays, standardization is believed to improve safety by reducing the number of new and untried components. The NES agrees that power plant designs should be standardized so that reviews need take place only once.

♦♦ Managing High-Level Nuclear Waste

Another major problem facing the nuclear industry is the growing backlog of undisposed high-level nuclear waste, that is, highly radioactive byproducts of nuclear power production that require special disposal. The Nuclear Waste Policy Act of 1982 directs the Department of Energy to establish a permanent repository for such waste, and a monitored retrievable storage facility (MRS) to hold the waste prior to permanent disposal. Yet just about all localities strongly oppose being the site of these repositories. As with other problems facing the nuclear industry, establishing these repositories is as much a matter of public perception as of technology. Although the NES suggests that Congress establish disposal sites, the political battle surrounding such decisions will result in further delays.

RENEWABLE ENERGY SOURCES

Renewable energy sources are those that are not depleted. The three principal renewable sources in America are hydroelectric power, geothermal power, and ethanol, produced from corn, grains, and other biological material. Solar power is a much less important renewable source. In 1990, renewable energy supplied 8 percent of American energy needs. Of this, about 47 percent came from hydroelectric dams. Solar power of all types accounted for under 6 percent of all renewable energy and less than one half of one percent of American energy needs. Renewable energy sources other than hydroelectric power or wood have grown in importance significantly since 1970, when they were virtually nonexistent. The NES strongly endorses the use of renewable energy, and calls for continued research and development in this area.

♦♦ Renewable Energy and Electricity

The NES recommends removing from the Public Utility Regulatory Policies Act of 1978 (PURPA) restrictions on the size of renewable energy plants. These restrictions are a holdover from the Carter Administration's emphasis on so-called "soft-path" energy schemes, which emphasized small-scale plants. These provisions made neither economic nor technological sense.

All hydro-electric plants are licensed by the Federal Energy Regulatory Commission, and the licenses periodically must be renewed. The licensing process has become extremely cumbersome. The NES suggests exempting very small hydro projects from FERC regulation, and streamlining the licensing process for all other plants.

♦♦ Ethanol

In 1978, Congress allowed a five-cent per gallon exemption from the federal gasoline tax for motor fuels blended with ethanol. And in 1980, the federal government granted a tax credit for refiners producing gasoline blended with ethyl tertiary butyl ether (ETBE), an ethanol-based gasoline additive. Because ethanol is more expensive than gasoline, its advocates believe a tax credit is warranted to allow ethanol to compete with gasoline. A look at the performance of ethanol in the market, however, suggests that such a credit is not needed. With around 10 percent of all gasoline being blended with ethanol or ETBE the need for the subsidy has passed. Ethanol is well established in the market and now competes with gasoline additives in about the same price range, rather than with gasoline. Clean Air Act of 1990 regulations effectively require many motorists in urban areas to use gasoline with ethanol, ETBE, or some similar additive. The NES thus errs in recommending that the ethanol tax credit continue. Instead, the subsidies for ethanol and ETBE should be eliminated.

♦♦ Fusion

Fusion long has held out the promise of tapping a virtually inexhaustible supply of energy without endangering the environment and without producing hazardous wastes. The NES calls for continued support of fusion energy research. This is wise, yet too much should not be expected of fusion soon. Under the most optimistic assessments, the first practical fusion energy plants will not be available until the year 2035.

IMPROVING ENVIRONMENTAL QUALITY

The needs to make America more energy secure and to protect the environment too often have been in conflict. Measures designed to protect the environment often wasted energy or restricted the use of such plentiful sources as coal.

The NES emphasizes the need to clarify uncertainties about some environmental issues that have impeded energy development. Typical of these issues are the claims about global climate change. NES stresses that research on these issues is essential before imposing regulations that could have disastrous economic consequences for American industries. The NES does call for measures to reduce the emission of "greenhouse gases," which may contribute to atmospheric warming, while the global warming issue is being studied. But NES specifies that these measures be limited to those justified for reasons other than potential global climate change.

The NES wisely rejects the notion of a so-called "carbon tax" to discourage fossil fuel use. Some environmentalists call for a $135-per-ton tax on the carbon content of fuels. This would damage the American economy enormously.

CONCLUSION

In the past, talk in Washington of an "energy policy" has meant cumbersome regulations, expensive new bureaucracies, and costly "conservation" programs and gas lines. How much energy, if any, is saved by these measures is debatable. What is not debatable is the enormous economic pain inflicted on Americans. A sound energy policy is not built on more regulations. A sound policy rather should remove impediments to the energy market, eliminate barriers to energy production, and facilitate innovation. This is what the National Energy Strategy recommends. America's level of foreign oil imports is too high – not because oil imports are "bad" for America but because dependence on oil from unfriendly and insecure parts of the world carries the risk of future damaging economic shocks.

Removing Tax Bias. America can increase domestic energy production and increase exploration to find new reserves if Congress and the White house amend the tax code to remove the bias against firms taking the risks necessary to find new energy supplies, if Congress and the White House allow exploration in the most promising areas for new oil discoveries, if Congress and the White House remove the regulatory impediments now discouraging gas producers and utilities from fostering greater use of natural gas, and if Congress and the White House encourage conservation by permitting the market to reflect the true cost of energy.

Americans, too, could move closer to secure foreign sources of supply if the U.S. were to negotiate a common market for energy throughout the Western Hemisphere.

Core Strategy. Americans enjoy one of the world's highest standards of living in large part because they have had ready access to abundant, inexpensive sources of energy. Continued access to abundant energy is essential to America's economic future, and history teaches that the best way to achieve this access is to permit markets to operate. Reliance on markets assures both abundant supplies and judicious use. As such, above all else, the core of any national energy strategy must be to permit markets to operate.

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CONCLUSION

In the past, talk in Washington of an "energy policy" has meant cumbersome regulations, expensive new bureaucracies, and costly "conservation" programs and gas lines. Then, as now, if anything is saved by these measures is debatable. What is undebatable is the enormous economic pain inflicted on Americans. A truly energy-wise policy would rely on more realistic, market-oriented policies. A truly policy-wise policy would remove high obstacles in the energy marketplace, eliminate barriers to energy innovation, and facilitate innovation. This is why the National Energy Strategy is unsensible. America's level of this tax on oil imports is too high — and because all imports are "load" (for [illegible] as they [illegible] on all fuels — it is unfair. Certainly and measure part of the world energy [illegible] and [illegible] economic shocks.

Ironically, this tax, intended to increase domestic energy production, has increased exploration in five new regions of Congress and the White House ground the tax and to reduce [illegible] agencies from using the tax [illegible] way to find new energy supplies. If Congress and the White House [illegible] pursue [illegible] in the same [illegible] as the new [illegible] of Congress and the Bush Administration [illegible] regulatory [illegible] and [illegible] producers and [illegible] from [illegible] greater use [illegible] natural gas, and if Congress [illegible] and the White House encourage conservation by permitting the market to reflect the true cost of energy.

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