TESTIMONY SUBMITTED TO
THE HOUSE SELECT COMMITTEE ON ENERGY INDEPENDENCE AND GLOBAL WARMING

BY CARL MICHAEL SMITH, EXECUTIVE DIRECTOR OF THE INTERSTATE OIL AND GAS COMPACT COMMISSION

June 11, 2008

My name is Carl Michael Smith. I am the Executive Director of the Interstate Oil and Gas Compact Commission (IOGCC).

The member states of the Interstate Oil and Gas Compact Commission (IOGCC) produce more than 99% of the oil and natural gas produced onshore in the United States. Formed by Governors in 1935, the IOGCC is a congressionally ratified interstate compact. The organization, the nation's leading advocate for conservation and wise development of domestic petroleum resources, includes 30 member states, 8 associate states, and 10 international affiliate countries and provinces. The mission of the IOGCC is two-fold: to conserve our nation's oil and gas resources and to protect human health and the environment during the production process. Our current chairman is Governor Sarah Palin of Alaska.

The purpose of this testimony is to give the IOGCC's perspective on the "Future of Oil". While most of us in the United States realize that the burning of fossil fuels is not without some negative environmental consequences, too few of us realize that there is no quick solution that is going to allow our economy to replace its reliance upon fossil fuels with another fuel source any time soon. It is wishful thinking to suggest otherwise.

While we clearly need to do all that is within our power as a country to conserve the use of our oil and natural gas resources, we need to be producing as much oil and natural gas as possible at home and on the North American continent. Every barrel of oil produced in the United States is a barrel that doesn't have to be imported. Every barrel of oil produced in the U.S. means that dollars will remain in the American economy, helping to provide Americans jobs. Every barrel of oil produced in the U.S. means that we as a country are that much less vulnerable to geopolitical instability.

I have attached to this testimony a copy of the IOGCC publication "Oil and Gas Policy Evaluation for Energy Security." I have also delivered enough copies of the publication for every member of the committee. The publication arises out of a resolution approved unanimously by the IOGCC in 2006. The resolution (06.052) called for the creation of a policy document based on an analysis of the nation's energy situation, including potential solutions to identified problems. The resolution directed the policy analysis to "avoid choices that will exacerbate our nation's energy situation by discouraging domestic production".

The report contains 5 key recommendations:

1. Improve dialogue with the American public about energy policy and its consequences to them.

2. Promote the expansion of research to recover domestic oil and gas resources.

3. Re-examine federal and state policies as they relate to oil and natural gas development in consideration of new incentives for exploration and production.

4. Encourage conservation of fossil fuel resources by the public and efficient production technologies.

5. Address the chronic shortage of skilled manpower for the American domestic oil and natural gas industry. Today some domestic exploration and production activities must be being delayed because of the shortage of skilled labor.

Too often we have resorted to an either-or mentality in the U.S. on energy policy. We have, for some reason, viewed energy policy as a zero sum game. In other words, we can encourage either development of renewable sources of energy or development of oil and natural gas but not both. My message to this committee today is that we can and must do both. Rational energy policy demands we address both elements, as well as, of course, conservation.

Thirty one states produce oil and/or natural gas in this country. Oil and natural gas producing states appreciate how blessed they have been to have had oil and natural resources within their borders. They understand the positive economic impact that having those resources has meant to their states. As the regulators of oil and natural gas production, states also realize that oil and natural gas can be extracted in an environmentally safe and responsible manner. It is the states' job, in fact, to ensure that production is developed in a manner protective of human health and the environment.

States also understand that most of the drilling for oil and natural gas here at home is done by small, independent oil and natural gas producers, and, that a large portion of our domestically-produced oil (onshore in the lower 48 states) comes from wells producing a small volume of oil on a daily basis. This production does not come from "Big Oil" but from the oil and gas industry's equivalent of the family farmer in small town America. These small producers do not have the resources to conduct oil

and gas R&D, yet they are affected by the meager amounts of federal R&D that might otherwise enable the small independent producer to keep his wells producing longer. Unfortunately, this small producer gets lumped into a groupthink that regards all oil and gas production in this country as "Big Oil" or all federally funded R&D as "corporate welfare". States know that neither is true. Indeed, without state incentives to the marginal oil and natural gas producer when oil prices were low for so many years, our country would be producing less oil than it is, making it that much more vulnerable to the vagaries of the international market.

In closing let me suggest that in reaching conclusions as to the "future of oil" that all Americans re-examine existing perceptions about oil and natural gas production in this country. States have an advantage being closer to where production actually takes place and are ready and willing to join an educational process.

Thank you for the opportunity to participate in this hearing. If I can provide any additional information, please do not hesitate to contact me.

Oil and Gas Policy Evaluation for Energy Security

Interstate Oil and Gas Compact Commission

February 2007

PREFACE

This document responds to a resolution of the Interstate Oil and Gas Compact Commission (IOGCC) approved unanimously at the 2006 Midyear Meeting. The resolution (06.052) called for creation of a policy document after an analysis of the nation's energy situation, with potential solutions to identified problems. The resolution directed the policy analysis to "avoid choices that will exacerbate our nation's energy situation by discouraging domestic production." This analysis took place over the summer of 2006 through a series of conferences sponsored by Congressional Quarterly in which the IOGCC participated. A team of experts identified by the IOGCC Steering Committee then developed the policy document.

Oil and Gas Policy Evaluation for Energy Security

BACKGROUND

After many months of high crude oil prices, the country has been re-awakened to the volatile nature of the world's oil supply, demand and price. With natural gas, heating oil and gasoline costs hitting consumers in the pocketbook, there is growing pressure on elected officials to act. Unfortunately, natural gas and oil are taken for granted in the United States, and thoughts of national energy policy surface only in response to perceived crises. When prices ease, so does the outcry for government action.

Represented by the Interstate Oil and Gas Compact Commission (IOGCC), governors have been calling for state and federal action on energy policy for years. Now, as debate about the country's energy future grows, the governors must serve as leaders in the evolution of America's energy policy. Before 1973, the elected leaders of the oil producing states virtually directed the nation's energy policy because, among other reasons, a policy-making vacuum existed at the federal level – particularly relating to oil and natural gas. The energy policies of the United States prior to 1973 went largely unnoticed by the public and untended by the federal government as long as the states were able to provide cheap oil and natural gas in abundance. The reality shifted when consumer demand and poor national policies overtook domestic production capacity.

Lack of an effective energy policy is hurting consumers, small businesses, industry and the nation. States have been leaders on a number of critical national issues when the federal government proved unable to develop a long-range, consistent policy position. While states can continue to be the leaders on energy policy, a more cohesive, consistent national energy strategy is long overdue. To that end, the IOGCC has conducted an evaluation, with recommendations to help states and the nation address oil and gas as part of a balanced energy strategy.

Many states have developed a state energy policy. The Texas Energy Policy, for instance, was developed in 2004 after a year of work by a task force created by Gov. Rick Perry's executive order. Similarly, the Oklahoma Energy Policy was developed at the initiative of the Oklahoma energy secretary. States across the country have put individual energy policies into their official records and some have acted on the recommendations in the policy documents. IOGCC looks forward to continuing to advise states on key energy policy issues in an effort to help develop a more cohesive domestic energy policy, in the absence of comprehensive federal action. IOGCC should consider model legislation/resolutions to develop for states as a part of that effort.

However, energy policy cannot be a one-time exercise. The best energy plan will be useless if it is announced with fanfare and then put on a shelf to gather dust. States should dedicate resources to implement a policy during all cycles of the volatile energy market. If energy prices plummet, states should remain just as vigilant concerning policy implementation as when the public becomes keenly aware of skyrocketing prices.

ENVIRONMENT

Looming on the horizon is the likelihood of an increasingly volatile natural gas market as the fuel gains a greater role in new electric generation facilities while representing 58 percent of the home heating market. Consequently, there is a need for well-designed, consistent federal and state policies to help address the natural gas market. The need to examine current policies relating to natural gas exploration and production, deliverability, incentives, and research and development

has never been greater. The National Petroleum Council (NPC) issued an important report identifying challenges to meeting growing consumption with domestic natural gas production.[1]

Increasing dependence on foreign crude oil and barriers to increasing domestic oil and natural gas production have captured the attention of governors of oil and gas consuming and producing states. Governors are keenly aware of the importance of conservation, efficient energy use, and development of alternate energy sources.

Cooperation among the states to conserve oil and natural gas began with the organization of the IOGCC in 1935. By virtue of its charter, the IOGCC is dedicated to conserving domestic oil and natural gas through orderly development and maximization of efficient production while protecting human health and the environment. For example, due to IOGCC efforts encouraging the application of secondary water-flooding, expectation of maximum efficient production from domestic oil fields increased from about 10 percent in 1935 to about 30 percent by the mid-1960s.

By early 1973, surging world demand for oil and natural gas caused by economic expansion and waning supplies resulting from the maturation and decline of many productive domestic oil fields brought the United States to a turning point. Our dependence upon foreign oil would become abundantly clear when the Arab Oil Embargo slashed crude oil imports from the Middle East. Our dependence has grown dramatically since 1973. But only recently has the national risk of our energy supply and its volatility started to receive growing attention. For instance, the U.S. Air Force accounts for more than half of the fuel the government uses each year. A reliable source of fuel must be part of our national defense strategy.

Crude oil is a world commodity. Countries with rapidly expanding economies, such as China and India, are accelerating world demand. This demand is pushing oil prices and will continue to do so. For instance, the potential expansion of the vehicle market in other countries will affect U.S. crude oil prices for decades to come.

As existing fields have matured, proven, available resources have not been brought on-line to replace them – primarily as a result of a long-term, coherent energy strategy that balances and incorporates ecological and environmental interest. As a result, America no longer possesses excess crude oil production capacity to meet the nation's cyclical oil and gas needs.

The nation continues to be self-sufficient in natural gas, producing 83 percent of the gas used in this country, with 14 percent imported by pipeline from Canada and the remaining 3 percent being liquefied natural gas (LNG) from overseas. The importance of LNG imports will continue to grow, and attention must be given to developing LNG facilities. The natural gas market is likely to mirror the oil market and rely on imports, unless we change course by accessing the huge natural gas supplies undeveloped in the Outer Continental Shelf and elsewhere in the United States.

Increases in demand for oil, or declines in domestic production, will continue to be offset by imports from foreign nations. Since the 1940s, America has been assisting foreign countries to develop their petroleum resources. It is no coincidence that foreign producing nations took two steps in their own best interest:

1. They wrested control of their resources from many American corporations that had developed the reserves; those corporations became managers of production, not owners.
2. They created an alliance called the Organization of Petroleum Exporting Countries (OPEC).

What happened next shocked the average American consumer. Governors of oil and gas producing states, under the auspices of the IOGCC, had been sending unheeded warnings of our precarious energy situation for years. OPEC flexed its muscles, showing its enormous political and economic strength, with the Arab Oil Embargo of late 1973. The price of crude oil went from an average of $9.70 per barrel in 1972 to more than $14.80 per barrel in 1974 (Figure 1). During succeeding price and supply shocks initiated by OPEC and driven by the world market, crude oil has reached prices exceeding $75 per barrel. However, in 1973, we were importing only 36 percent of our crude oil and in 2006 we imported 65 percent (Figure 2).

Figure 1- Oil Price Fluctuations (1970-2006)

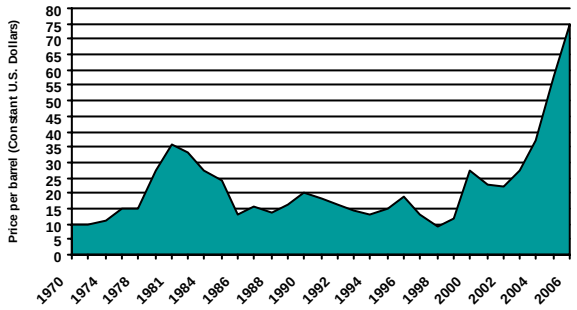
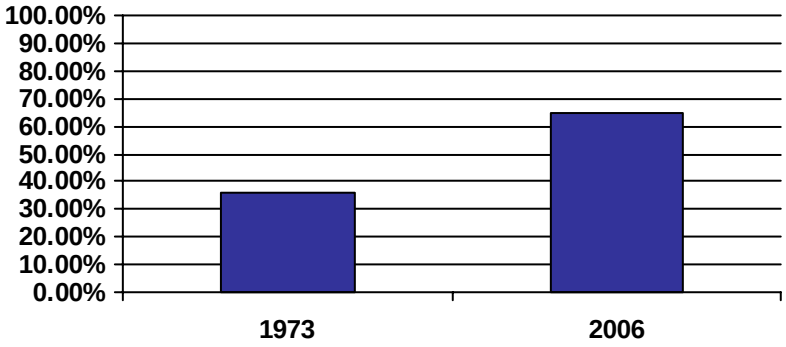
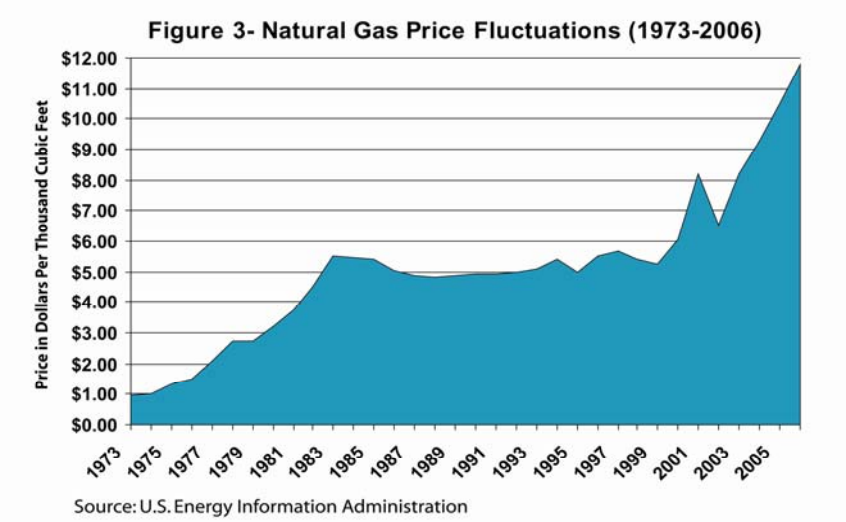


Figure 2- Imported Crude Oil



Although the states remained active, the direction of energy policy and regulation shifted to the federal government, which made several attempts to write, control and implement a national energy policy. Since the inception of the U.S. Department of Energy (DOE) in 1977, eight plans have been enacted. Some results have been positive, such as domestic research to increase production efficiency and to develop unconventional resources. Others such as the Windfall Profits Tax and price controls on crude oil – when an increase in price would have curbed demand – have been counterproductive and in some ways harmful to the nation's energy needs.

Similarly ill-advised price controls on natural gas, with complicated pricing tiers and definitions, created confusion in the marketplace and skewed the focus of exploration and production (E&P) efforts. Price controls have been blamed for manipulating the market to the point of creating artificial shortages (Figure 3). Yet, despite this sad result, there are those in Congress again suggesting price controls as a solution.

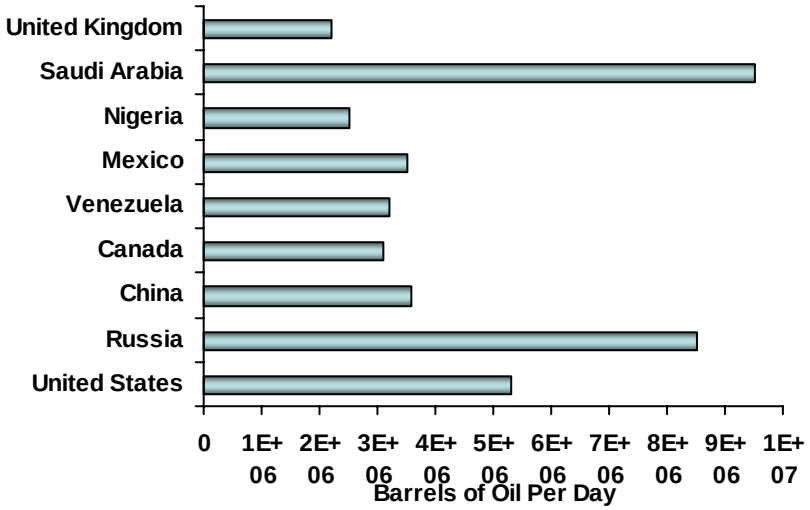


During this tumultuous period, many important facts regarding the domestic oil and natural gas industry were lost in the rhetoric. For example, the oil and natural gas that states produced made it possible for America to become an industrial power with a competitive edge in the world marketplace due to low energy costs. Oil and gas resources also provided Americans with the highest ratio of motor vehicles per citizen in the world and the means to fuel them. They have fueled a thriving and expanding airline industry, which has helped break down barriers to travel, communications, and domestic and international commerce. These fuels have provided the means to heat, cool and light homes and businesses providing comfort and convenience.

At the same time, American capital and know-how were applied around the world as developing oil regions were identified. The entire world benefited from the expertise and education supplied by the U.S. petroleum industry. Our state universities have trained, and continue to train, the world's petroleum scientists.

Meanwhile, the domestic industry maintained the distinction as the world's most efficient conservator of oil and natural gas. The United States is the only country that captures significant quantities of oil and natural gas from marginally economic wells. Through efficient operating practices and the application of advanced technologies, marginal wells accounted for nearly 316 million barrels of oil and 1 trillion cubic feet (Tcf) of natural gas in 1998, according to the IOGCC's survey of such wells, *Marginal Oil and Gas: Fuel for Economic Growth*.[2] The latest IOGCC survey of states for 2005 marginal well production indicates 321 million barrels of oil and 1.76 Tcf of natural gas harvested. This represents a sizable increase in production since 1998 and an indication of the importance of these small wells in meeting domestic demands. Marginal wells represent 17 percent of domestic oil and 8 percent of natural gas production. Some 400,000 of the 550,000 domestic oil wells (73 percent) produce an average of 2.2 barrels per day. Production in the United States averages slightly more than 5 million barrels of oil per day. This contrasts sharply with a daily average production of 9.5 million barrels in Saudi Arabia (Figure 4). Nowhere else in the world can operators maintain economic production from a well that produces only 2 barrels per day. America has been able to continue to produce its maturing resource at such rates which is testimony to the industry's hard work and ingenuity and the untiring efforts of groups such as the IOGCC.

Figure 4- Daily Average Production (Selected Countries)

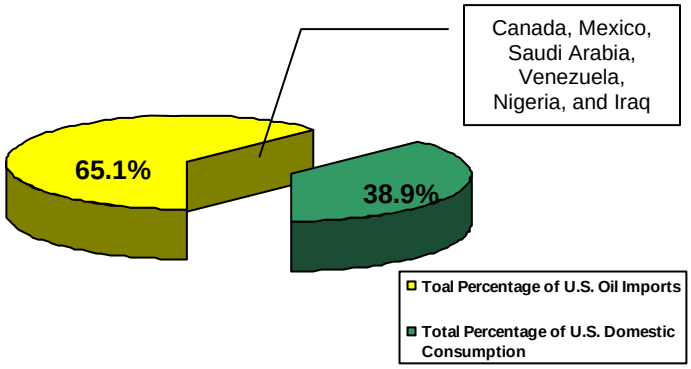


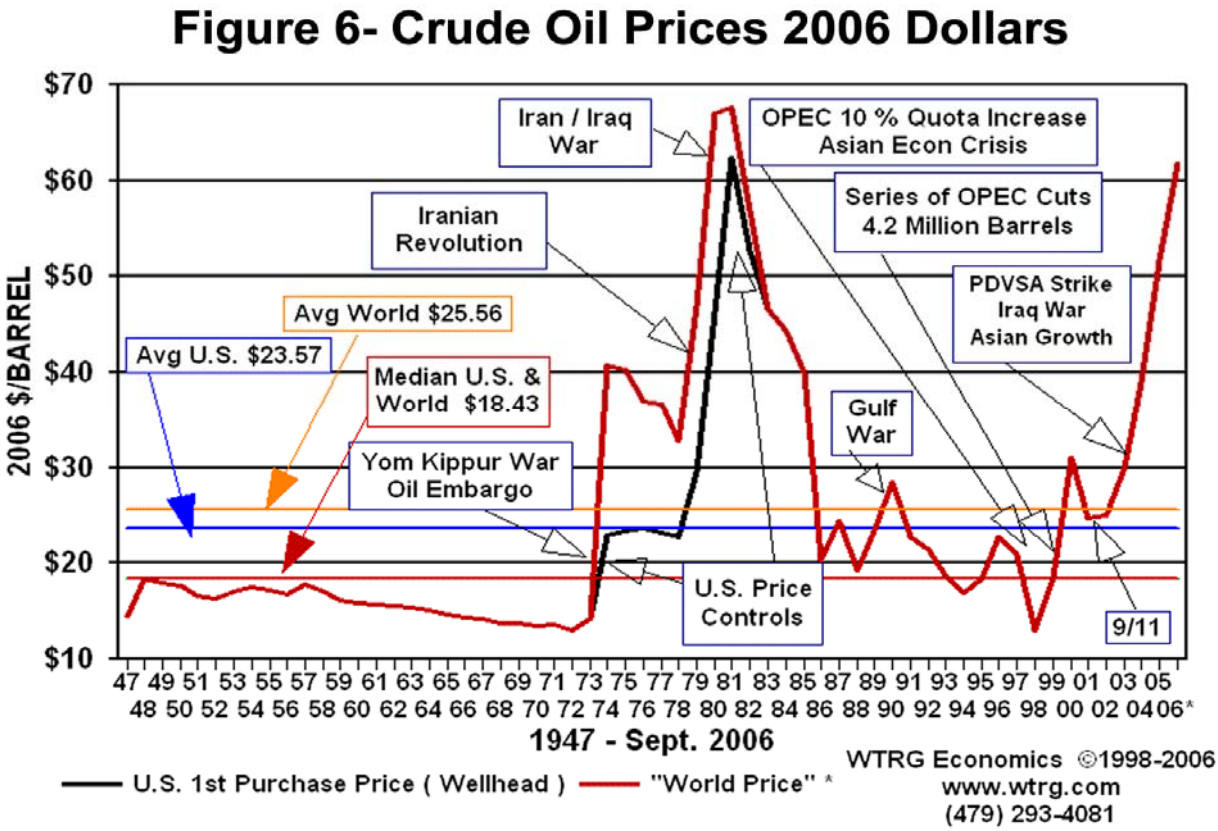
Events in the Middle East continue to affect oil prices as OPEC exerts market control. Current military operations in Iraq and Operation Desert Storm in the 1990s underscored the nation's reliance on Middle East oil and the political instability that characterizes the region. The U.S. has moved toward other sources of foreign crude, notably Latin American countries, which now are growing increasingly less stable. Perhaps as another policy misstep, recent gasoline price increases spurred the U.S. House of Representatives to consider legislation to enable the president to investigate price fixing by OPEC and oil companies.[3]

The country faces a serious threat to national energy security. According to DOE, the U.S. currently consumes about 21 million barrels of oil per day. This demand is expected to grow unabated to 28 million barrels per day by 2025. Recently, oil prices have consistently remained above $60 a barrel, with frequent spikes approaching $80 a barrel. Natural gas prices have remained near $9 per Mcf for the past several years. High natural gas prices not only hurt residential consumers, they cost American farmers $6 billion more in 2004 than in previous years. They also increase costs to our manufacturing base, making American products less competitive in the global marketplace and often driving investment overseas. Meanwhile, gasoline, diesel and electricity prices have remained near historic highs.

The top six sources of U.S. oil imports - Canada, Mexico, Saudi Arabia, Venezuela, Nigeria and Iraq - account for 65.1 percent of all foreign crude reaching our shores and 38.9 percent of total domestic consumption. Of these, Saudi Arabia, Venezuela, Nigeria and Iraq provide 38.2 percent of oil imports and 22.6 percent of total consumption. For a variety of reasons, none of these currently can be considered a reliable source of supply (Figures 5 and 6). Only Canada and Mexico can be considered reliable long-term suppliers. Nigeria's production has been disrupted repeatedly by civil unrest, and some 135,000 barrels of oil per day are lost to theft.

Figure 5-Imports vs. Domestic Consumption





A terrorist attack in 2006 on the massive Saudi oil processing facility at Abqaiq was barely thwarted, but not before two of the terrorists' explosive-laden cars were detonated. This was not the only instance of an attempt to disrupt the flow of Saudi oil. In the summer of 2002, Saudi Interior Ministry forces blocked an al-Quaida plot to attack and cripple the loading dock at Ras Tanura, which handles 10 percent of the world's oil supplies.

According to the National Defense Council Foundation,

> "Given the instability that characterizes four of our top six sources of oil, the question is not whether we will experience a supply disruption, but rather when. The disruption could occur as a consequence of a terrorist act, or could result from a politically motivated embargo. In the end, it doesn't really matter why a disruption occurs, because the consequences would be identical, and severe.
>
> "The supply disruptions of the 1970s cost the U.S. economy between $2.3 trillion and $2.5 trillion. Today, such an event could carry a price tag as high as $8 trillion – a figure equal to 62.5 percent of our annual GDP, or nearly $27,000 for every man, woman and child living in America."

Increases in oil and natural gas prices result from geopolitical instability as well as growing United States and global demand that has not been matched by equivalent increases in available supplies. Unless supply can be increased, prices will continue to rise and become increasingly more susceptible to frequent spikes. A recent survey by the National Association for Business Economics found that high energy prices are the biggest short-term problem facing the U.S. economy.

In 1994, the U.S. Commerce Department concluded that volatile oil imports were a serious threat to national security. A second study, reaching a similar conclusion, was delivered to President Bill Clinton in November 1999. [4]

The White House waited to respond until March 18, 2000. President Clinton called for the creation of a home heating oil reserve similar to the Strategic Petroleum Reserve and tax incentives for both the domestic oil and natural gas industry and renewable energy sources. [5]

Oil imports are at record levels. U.S. demand for crude oil continues to grow despite higher prices for gasoline. U.S. petroleum demand in 2006 averages 21.07 million barrels per day and is expected to reach 22.2 million barrels by 2010, according to the Energy Information Administration (EIA) of the U.S. Department of Energy. Additional demand for transportation fuel, which accounts for two-thirds of U.S. petroleum consumption, is largely responsible for the increase. Oil imports of 4,527,024 million barrels for 2006 would supply nearly two-thirds - 57.8 percent - of U.S. demand.

The United States is engaged in a global war against terrorism, the geographic focal point of which is the Middle East and the world's largest conventional oil reserves. Our strategic vulnerability is accentuated by the fact that U.S. domestic oil production has been declining since 1973, and now stands at only 5.1 million barrels per day; compared to U.S. consumption of 21 million barrels per day. [6] This gross imbalance between domestic production and demand cannot be allowed to continue. The United States <u>can and must</u> produce more oil and gas domestically – to do otherwise is irresponsible. The United States. <u>can and must</u> curb demand through increased conservation and use of viable alternatives to crude oil where practical, such as ethanol in the Midwest and nuclear and coal in other regions.

Due primarily to congressional actions, and despite the safe environmental track record of industry, access to significant quantities of conventional domestic resources have been thwarted. For example, the undiscovered, technically recoverable oil and gas resources in the Outer Continental Shelf and offshore Alaska are enormous:

OCS and Offshore Alaska: Undiscovered Technically Recoverable Resources

Region	**Oil**	**Natural Gas**
Pacific Offshore	11 billion barrels	21 Tcf
Gulf Offshore	37 billion barrels	244 Tcf
Atlantic Offshore	4 billion barrels	33 Tcf
Alaska Offshore	26 billion barrels	122 Tcf
Total	**78 billion barrels**	**420 Tcf**

Collective Sources*: Minerals Management Service, U.S. Geological Survey, Bureau of Land Management, National Petroleum Council, and American Petroleum Institute.*

The above table does not include undiscovered and technically recoverable resources on federal lands that presently are off-limits to domestic exploration and production.

Onshore Federal Lands: Undiscovered and Technically Recoverable Resources

Region	Oil	Natural Gas
Lower 48 States	7 billion barrels	148 Tcf
Onshore Alaska	18 billion barrels	69 Tcf
Total	**25 billion barrels**	**217 Tcf**

Collective Sources*: Minerals Management Service, U.S. Geological Survey, Bureau of Land Management, National Petroleum Council, and American Petroleum Council.*

Combining potential onshore and offshore resources in the lower 48 states with those of Alaska onshore and offshore, produces an estimated 103 billion barrels of potential oil and 637 Tcf of potential natural gas. This amount of natural gas is enough to heat 60 million homes using natural gas for 120 years. In addition, 103 billion barrels of oil would power 55 million vehicles and heat 24 million homes for 30 years. [7]

With the full and environmentally safe use of these vast domestic resources coupled with current proven domestic oil reserves of 21 billion barrels, the United States could substantially reduce or eliminate its current oil demand of 2.3 million barrels a day from the highly volatile Middle East and the 1.3 million barrels/day from politically unstable Venezuela.

Combining our nation's 21 billion barrels in proven oil reserves with the potential 103 billion barrel reserves onshore and offshore presently controlled by the federal government would catapult total U.S. reserves to 124 billion barrels – more than the proven reserves of Iraq (115 billion barrels), Kuwait (104 billion barrels), the United Arab Emirates (98 billion barrels), Venezuela (80 billion barrels) or Mexico (13 billion barrels). [8]

While advances have been made in the techniques of finding, producing and transporting natural gas, challenges lie ahead if United States natural gas demand continues to increase as expected from 22.21 Tcf in 2005 to 23.35 Tcf in 2010. The country needs aggressive conservation of natural gas from the wellhead to the consumer's usage patterns.

Canadian imports are expected to increase from 3.68 Tcf in 2005 to 5 Tcf by 2010 and will continue to supply 13-14 percent of U.S. demand. [9] New supplies clearly must come from domestic resources and conservation must be viewed as a "supply" along with new development of the resources. The National Petroleum Council (NPC) concludes that, for domestic production to satisfy demand, the issues of access to resources, technological advancement, financing for infrastructure and exploration, availability of skilled workers and drilling rigs, long lead times for production, and changing customer needs must be addressed in a comprehensive way. [10]

Governors, state legislatures, chief state agency executives and the public have become increasingly concerned that the energy policy of the United States is adrift and does not address the nation's energy needs.

The Energy Policy Act of 2005 (EPACT) was enacted after years of work with a broad-ranging variety of provisions needed to appease various energy interest factions. EPACT was an attempt at energy policy and included some provisions that move the country forward on key energy issues, but more needs to be done.

The Oil and Gas Journal recently said, "The central problem, in fact, is that the (federal) government seldom really makes energy choices for consumers; it makes them for energy producers on purely political grounds. This type of politically motivated fuel selection would rot the core of any Manhattan Project for energy, such as has been proposed regularly since oil prices

began to climb. The 'comprehensive energy legislation' that became the Energy Policy Act of 2005 took an ill-fated step in that direction.

"So, how does a government stay on a constructive course with energy? It does so by establishing and following principles. Political pragmatists cringe at such behavior. They dismiss anyone asserting principles as 'ideologues' and, in the name of political pragmatism, fashion energy legislation by dispensing favors to special energy interests, the most politically aggressive of which tend to be producers of energy types no one wants to buy."[11]

There is perhaps no larger contributor to the high quality of life in the United States than energy, the largest sources of which are oil and natural gas. Yet the nation lacks a comprehensive policy to guide oil and natural gas producers, regulators or consumers that would ensure these vital energy forms continue to contribute to the nation's economic growth and security.

The federal government has worked to develop "energy policies," including the Energy Policy Act of 2005 and current efforts to modify the offshore production moratorium, but with marginal success. Regardless of the cause, the federal government cannot establish comprehensive energy policy on its own.

The leadership role in developing energy policy again has fallen to the states. Many have developed policy documents and some have initiated follow-up plans to those state policies.

Throughout its more than 71 years, the IOGCC, with 30 member states and seven associate states, steadfastly has supported the development of a national oil and natural gas policy to minimize the loss of domestic resources, protect the environment, enhance economic development, safeguard national security and lessen dependence on foreign sources of petroleum. These are the building blocks for a more secure energy future.

CONSUMER IMPACTS

Because of this lack of cogent national energy policy, U.S. consumers are faced with tighter energy supplies, fewer real options and ever-increasing energy prices – in all sectors of the energy industry. Since 1980, U.S. energy consumption has increased by 30 percent, while U.S. energy supply has increased by only 15 percent.

Since 1995, U.S. energy consumption has increased by 12 percent, while U.S. energy supply has increased by only 1 percent.

By 2025, U.S. need for energy will dramatically increase for all energy resources:

- Petroleum by 47 percent;
- Natural gas by 54 percent;
- Renewable energy by 46 percent; and
- Coal by 30 percent.

Higher energy prices have had a significant impact on the U.S. economy, from various industries to the small business owner to the individual consumer. In all, high energy prices (particularly natural gas) have cost the economy 2.8 million United States jobs since 2000. Since 2004, high energy prices have slowed United States economic growth by 0.5 to 1.0 percent.[12] Many sectors across the U.S. economy have had to compensate for their increased energy costs by passing

along these costs to their consumers. For those not able to pass along the costs, they have experienced significant financial losses.

Agricultural Sector

Petroleum-based products and natural gas are required for all aspects of farming, including food processing, agricultural chemicals, fertilizers, irrigation energy, crop drying and heating farm buildings. The abundance of cheap oil and natural gas long made such necessary elements affordable for American farmers.

However, at today's oil and natural gas price levels, the American agricultural sector faces some tough challenges. The ability of American farmers to produce a sufficient and affordable food supply for the American public is in danger. Rising energy prices have created higher production costs and increased fertilizer prices. Fuel expenditures for farmers increased 36 percent during 2004/2005. Further, many farmers are unable to fully transfer those costs to the consumer. The result could be a serious decrease in net farm income, which could alter the landscape of rural America and force difficult employment, travel and lifestyle decisions upon families.[13]

Yet, the average American consumer is not far from feeling the effects of this problem. If farmers cannot maintain the current food supply, the entire American food system will be threatened. The American public will undoubtedly face the challenge of changing their consumption habits. Representing more than 140 members across a range of foodservice distributors, the International Foodservice Distributors Association (IFDA) reports their members identified increasing fuel costs as the industry's third largest expense after labor and health care costs. IFDA members travel more than 75 million miles a year and consume more than 85.6 million gallons of fuel annually.[14] Although many food service operators expect growth in their sales and profits for 2007, some analysts project modest sales increases, which mean operators will need to concentrate on efficiency and cost-management strategies to sustain margins.[15]

Small Business Sector

While the agricultural and foodservice distributor industries have been struggling with augmented energy costs, many other segments of the U.S. economy have also been dealing with similar issues. In particular, the small business sector has been considerably affected by rising energy prices. Representing more than 150,000 small businesses, the National Small Business Association conducted a June 2006 survey of 409 small business owners. When asked how their businesses were impacted by rising energy prices, 75 percent of respondents replied they were moderately to significantly affected by rising energy costs. Moreover, 43 percent of those surveyed had to pass these costs along to their customers, most often in the form of increased prices.

Surprisingly, 76 percent of the business owners said reducing energy costs would increase their profitability. However, more than half of them reported they did not plan to invest energy efficient methods of operation for their facilities. Despite large policy strides toward implementing energy efficiency programs for businesses, many small business owners felt that cash flow, lack of resources and available technology were obstacles in making their organizations and facilities more energy efficient.[16] For many of those operating within the small business sector, energy price stability is a fundamental part of maintaining a profitable organization.

Transportation Sector
Though mounting energy costs have impinged on a wide range of industries, the individual consumer has undoubtedly linked increasing costs to the notable spikes in the cost of gasoline. Due to increasingly volatile energy prices and increased reliance on imports, the consuming public keeps paying more than it can afford to its power cars and trucks. In fact, the average American household will spend approximately $2,500 on gasoline this year, almost twice more than what it might spend on total energy costs for the year. [17]

What was the biggest factor? It was the dramatic increase in the price of crude oil, which alone comprises more than 50 percent of pump prices. [18]

Although market forces have lowered the price of crude to around $56 per barrel, it rose to record levels at more than $70 per barrel several times in 2006.[19] However, should some of the U.S. domestic and imported oil sources become less secure, a drop in supply would have a major impact on crude oil prices and would undeniably hit gasoline retailers and energy consumers hard. Coupled with federal, state and local taxes, the cost of gasoline could cause significant problems for the average energy consumer commuting, traveling, conducting business and even flying. In fact, higher fuel prices cost U.S. commercial air carriers $9.6 billion in fiscal year 2005. [20]

While there has been growth in the alternative fuels and vehicles industries, it may take some years to turn over the entire fleet of vehicles driven by Americans. The average life span of a car or light truck is almost 17 years, so traditional fuels will be needed for many years to come, even if each new vehicle purchased utilized an alternative fuel.[21] Much of the same can be said for the full development of certain alternative fuels and energy resources, which may take years before they are commercially viable. Even the onset of ethanol use has faced challenges, as the transition to ethanol blends has caused the change over of tanks at terminals, the need for a more expensive gasoline blendstock to combine with ethanol and logistical problems delivering ethanol to some areas. [22] Though the United States must continue efforts to seek such alternatives, near-term available supplies of oil should be sought and better utilized.

Housing Sector
In addition to absorbing increased transportation costs, consumers have been heavily impacted by rising energy prices in their own homes. Approximately 8.1 million American households use heating oil as their main heating source. [23] Thus rising crude oil prices (which, in 2004, accounted for 57 percent of the cost of heating oil[24] can significantly impact the average American household.

For low and middle-income families, increasing energy costs (and, in particular, the cost of home heating and gasoline) comprise a notable portion of the household income. If household energy expenditures are calculated as a percentage of income, middle-income households experienced a cost increase of approximately 1.5 percent from 2004 to 2005, from 5.1 percent to 6.6 percent of the household income. For low-income households with a vehicle, the cost increase is even greater at 5.5 percent, from 16 percent to 21.5 percent. [25] Such price volatility has made it extremely difficult for some families to operate within their normal budget structures, particularly those living on a more limited income.

Fluctuations in energy prices have been a key concern for many industries, small businesses and individual energy consumers for some time. Many aspects of modern life require the power

provided by a range of petroleum products. However, many factors are threatening American access to such products, which could result in dire consequences for the nation economically. Securing the nation's access to oil and natural gas resources and encouraging the efficient utilization of all energy sources will benefit the entire energy consuming public.

RECOMMENDATIONS -

1. **Improve dialogue with the American public about energy policy and its consequences to them.**

National and state policies and those recommended by various government and non-government organizations need to examine and communicate the consequences of the proposed energy policy on consumers. Consequences should include costs to taxpayers, impact on consumers, environmental consequences, and how much energy can be provided, and when, as suggested by the Oil and Gas Journal. [26]

Americans pay only a fraction of the true cost of imported oil at the pump. Their tax dollars, in effect, subsidize the economies of foreign countries by ensuring shipping lanes remain open and safe, oil fields are protected, and capital is available to improve deteriorating infrastructure. Meanwhile, Americans and the world populace will share in future costs of massive environmental remediation that will occur in foreign countries with lax or nonexistent oil and natural gas environmental regulations. These costs must be quantified and communicated.

The American taxpayer heavily subsidizes renewable fuels. A proper national energy policy appropriately supports new domestic fuels to create incentives for their production, and the American public deserves to know what is being paid.

While current prices have softened the impact on consumers, the economies of states and the nation can be hard hit when prices fluctuate, with the decrease in royalties and taxes associated with domestic production, the elimination of 529,000 high-quality jobs (according to data complied by the U.S. Bureau of Labor Statistics and the IOGCC), and the loss of billions of dollars in revenue.

Stripper (low-volume) wells are important contributors to the nation's economy. In 2005, stripper wells alone were responsible for $3.5 billion in employment earnings, $40.7 billion in economic activity and $192.6 million in state severance taxes. [27] These important wells must not be ignored by state and national energy policies.

To create meaningful energy policy, the American public must first be allowed to evaluate the true cost and consequences of all tax subsidies and the actual cost of imported oil and then consider cost-effective options to stimulate domestic production.

While determining the precise cost of a barrel of imported oil is a challenge – especially considering the massive world environmental costs associated with poor production practices in countries other than the United States and Canada – a range of cost estimates could be developed. More importantly, the cost of imported oil to the United States economy should be established so policy makers have a clear basis for making decisions.

The arguments for including United States military costs are clear and logical – our Middle East presence is influenced in part by the presence of oil.

A December 1996 study, *Energy Security: Evaluating U.S. Vulnerability to Oil Supply Disruptions and Options for Mitigating Their Effects*, by the U.S. Governmental Accountability Office (GAO) has underscored the importance of understanding hidden costs. The GAO reached a shocking conclusion: the economic benefits of imported oil outweigh the costs of supply disruptions. The GAO admits that some hidden costs of imported oil were not included, such as those cited in this recommendation. The report leaves a startling, but unwritten impression that all U.S. oil needs should be filled by imported crude.

The highly questionable methodology used by the GAO in reaching its conclusions indicates problems encountered in establishing domestic oil and natural gas policy. Petroleum is increasingly used as leverage in international relations, so discussions of domestic policy are clouded by the potential use of petroleum as a diplomatic or political weapon.

An equally inappropriate use of oil for political posturing involves use of the Strategic Petroleum Reserve (SPR) for short-term concerns, such as a temporary increase in gasoline costs driven by market demand. The entire cost of building, stocking and maintaining the SPR is a factor that must be considered as we assess the cost of imported oil to the United States economy. The interest on that investment, as well as the operating cost, tops $1 billion annually.

Another cost to be assessed is the development of alternate energy sources. Since the 1973 oil embargo, taxpayers have poured tens of billions of dollars into developing alternate sources. In addition, the state and federal governments poured tens of billions of dollars into energy conservation measures in buildings, which has little or nothing to do with imported oil used to fuel transportation. Conservation and increased energy efficiency are hugely important to any energy policy, but consumers deserve an honest assessment of the conservation impact on the fuel being targeted for conservation. That is, replacing an inefficient natural gas furnace with one of high efficiency is extremely important to the wise use of the natural gas resource, but claiming that replacement cuts the need for imported crude oil is disingenuous.

As we have increasingly turned to imported oil for our transportation needs, we have encouraged the loss of domestic infrastructure and decreased domestic areas available for exploration and production – other consequences to be considered when evaluating the cost of imported oil to the U.S. economy. Additional, unmeasured costs to the economy result from the impact of imports on the U.S. trade deficit.

As noted by authors Donald P. Hodel and Robert Deitz in their book *Crisis in the Oil Patch*, "Our purchases of foreign oil have contributed more to the growth of the trade deficit than any other single commodity. In fact, over the past twenty-plus years we have imported more oil than the net difference between our purchases and sales of automobiles, electronics equipment and other finished goods." [28]

Oil imports for the year 2005 were $182.13 billion, which represents more than 25 percent of the U.S. trade deficit. According to a report by the National Defense Council Foundation (NDCF), the effects of imported oil are much higher than that. The report looked at three different aspects that affected the "hidden" costs of imported oil. First, the United States pays $49.1 billion annually to defend the flow of Persian Gulf oil. Secondly, the NDCF found that the cost of imported oil leads to the loss of 828,400 jobs in the U.S. economy and a loss of $159.9 billion in GNP annually. The report also concludes that there is a loss of $13.4 billion in federal and state revenues each year. [29]

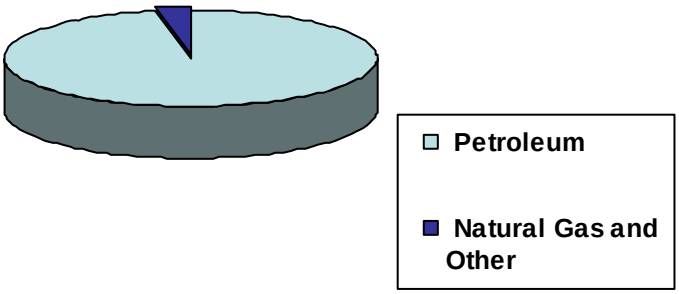
The implications of the massive transfer of private sector wealth from the U.S. to foreign countries have not been fully examined, but should be.

Taken together, these estimates of the true cost and consequences of imported oil will permit the American public to evaluate cost-effective options for encouraging domestic production. Consequently, an on-going public education program and discussion should be developed to fully inform the public regarding the nation's energy circumstances so Americans can make proper consumer choices, and support sound long-term energy policy choices by public officials.

2. Promote the expansion of research to recover domestic oil and gas resources.

Oil provides 97 percent of our transportation fuel (Figure 7) .

Figure 7- Transportation Fuel Shares



In 2003, the Gulf of Mexico offshore waters contributed 29 percent of the oil produced in the U.S. and 22 percent of domestic natural gas production.

The 1.5 million barrels per day of oil from central and western Gulf of Mexico waters is equivalent to our imports from Saudi Arabia.

The 4.4 Tcf of natural gas produced annually from central and western Gulf waters is enough natural gas to meet more than 80 percent of the electric industry's needs.

According to conservative estimates from Minerals Management Service there are about 288 Tcf of natural gas and 52 billion barrels of oil in the Outer Continental Shelf (OCS) off the lower 48 states:

- This is enough oil to maintain current oil production for 105 years and current natural gas production for 71 years.
- This is enough oil to produce gasoline for 132 million cars and heating oil for 54 million homes for 15 years.
- This is enough oil to replace current imports from the Persian Gulf for 59 years.
- This is enough natural gas to heat 72 million homes for 60 years, OR to supply current industrial and commercial needs for 28 years OR to supply current electricity generating needs for 53 years.

And, that is before the Alaska OCS - with additional resources of 132 Tcf of natural gas and more than 26 billion barrels of oil - is considered.

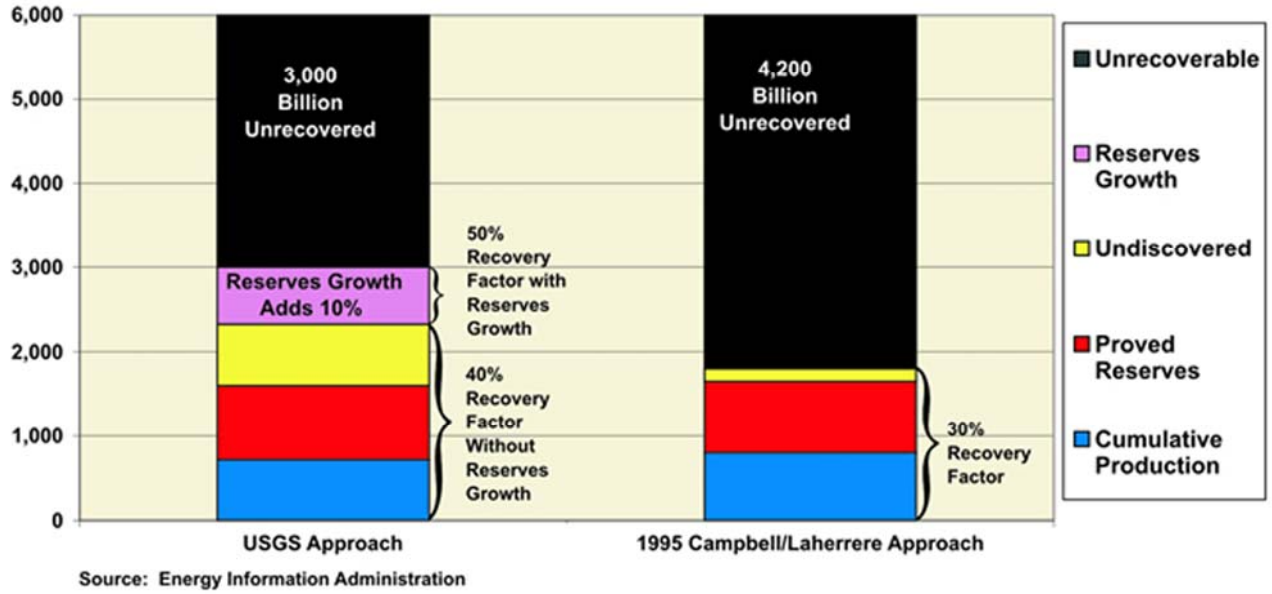
The use of modern technology helps ensure environmental protection. For example, 2005 hurricanes hit 2,900 platforms with 170 mph sustained winds for 5 to 7 hours, yet no appreciable leaks developed.

The advancement of new technologies in the energy sector remains one of the bright spots of the nation's energy future - and perhaps one of the most neglected by policy makers. New technology has been a principal driver of new oil and gas development in the Gulf Coast, the Arctic and across the West. Yet, oil and gas research and development funding at the federal level has been dismal in recent years. Research and development programs should be initiated and properly funded by the states and the federal government, and should offer alluring incentives to the private sector.

This far-reaching recommendation encompasses a number of initiatives designed to ensure the nation's reserves are fully developed. To make informed decisions regarding the nation's energy future, the public must have definitive information on the actual domestic petroleum resource.

For example, there are vast known reserves of oil in the United States. The IOGCC estimates that 351 billion barrels will remain in the ground after conventional recovery technologies have been applied (Figure 8).

Figure 8 - Different Interpretations of a Hypothetical 6,000 Billion Barrel World Original Oil-in-Place Resource Base



In addition, there are oil and natural gas reserves located on private and public lands and offshore that have not been analyzed or catalogued. Some of these reserves may exist in environmentally sensitive areas or in difficult-to-access locations that would require extraordinary exploration and production measures or advanced research to develop. Therefore, in addition to identifying the entire oil and gas resource base of the country, research should include estimates of the time required to bring these resources into production.

Defining these resources is only a first step. As an advocate for oil and natural gas research, the IOGCC also strongly supports programs that create technology to improve recovery rates and

lower exploration and production costs. Such research and development (R&D) is an investment in the country's future and its energy security. Technological advance might be the most important factor in ensuring that America's nonrenewable resources are fully developed.

A decade ago, the Task Force on Strategic Energy Research and Development noted, "There is growing evidence of a brewing 'R&D crisis' in the United States – the result of cutbacks and refocusing in private-sector R&D and reductions in federal R&D. Support for research and development is indeed being simultaneously reduced in the private and public sectors. R&D cannot be turned on and off like a water tap. The acquisition and embodiment of new knowledge in new products and services for the economy is a cumulative process that requires continuous effort to sustain. The accumulation of cutbacks in public and private R&D could be setting the stage for a major shortfall and ensuing setbacks in R&D in the United States – characterized by the lack of consistent attention to longer-term needs and problems, a shrinking population of scientists and engineers available to perform high-quality R&D, and a loss of incentive and opportunities for new generations of technologists."[30]

Nothing has changed since that report. In the Fiscal Year 2007 budget, the House Appropriations Committee basically zeroed out natural gas and oil research spending and the Senate Appropriations Committee also slashed R&D spending. While the cyclical nature of petroleum prices is well understood, policy leaders in the White House and Congress have concluded that the current elevated oil price means R&D should be financed by the industry.

A 2006 report commissioned by the IOGCC confirmed the declining trend in oil and gas research and development. "When private R&D is compared to federal expenditures, the outlook is bleaker. Private spending is substantiated but federal spending remains disproportionately small compared to the relative importance of oil and gas to U.S. energy requirements."[31]

A 2006 study published by the IOGCC expressed alarm at the loss of experience and entry-level technical personnel, noting "there is a 5- to 7-year gap between decisions to increase exploration budgets and resulting new oil production, even when experienced technical staff is available. However, few have considered the long-term effects of the 1986 petroleum jobs massacre (in which 500,000 jobs were lost) and how the events of 20 years ago will influence future energy policy and supplies. Any crisis in oil supply causing increases in domestic activity will be constrained by lack of qualified staff."[32]

The federal government could fill a vital leadership role in reversing the trend. The country's network of national laboratories, for example, seems ideally suited for energy research.

In addition, the IOGCC supports a restoration of DOE resources to provide additional research and development funding. The DOE's budget request totals $23.6 billion for Fiscal Year 2007. For fossil energy research and development, DOE is requesting $330 million to be focused on coal research, less than 2 percent of the budget. Currently no portion is allocated for oil and natural gas research. Oil and natural gas research was zeroed out in the Bush Administration's budget recommendation. However, these fuels deliver more than 85 percent of the country's energy.

The DOE's Office of Fossil Energy highlighted the importance of R&D in 1999. "Looking forward, the domestic oil and gas industry will be challenged to continue extending the frontiers of technology. Ongoing advances in E&P productivity are essential if producers are to keep pace with steadily growing demand for oil and gas, both in the United States and worldwide."[33]

The NPC notes "producers are turning to the service sectors to develop new technology for specific applications. Industry consortia have been formed to address critical technology challenges such as deep-water development. While many of these changes improve the efficiency with which research and development dollars are spent, concerns have been widely expressed that basic and long-term research are not being adequately addressed." [34]

Meanwhile, solar and renewable technologies, which provide less than 10 percent of U.S. energy, would receive nearly $1.2 billion. This represents a 2 percent increase in funding.

The IOGCC supports a drastic shift in how available tax dollars are spent. In the early years of the DOE, large and expensive demonstration projects dominated R&D spending. "That early emphasis on demonstration projects, reflecting the turmoil of the late 1970s, was, in retrospect, misplaced."[35]

Despite billions of dollars spent on renewable energy R&D during the period of 1990-2006, there has been little impact by renewables on the nation's total energy consumption pattern (Figure 9). In fact, in 2005, renewables supplied a nearly identical percentage of the nation's total energy consumption as in 2001.

Figure 9 Comparison of U.S. Department of Energy Research and Development Budget Request
(Fiscal Years 2001 and 2006)

	FY 2001	FY 2006
Coal and Power Systems	$193	330
Electrical Energy systems and Storage	45	3
Fusion Energy	218	296
Natural Gas	107	0
Nuclear Technology	109	90
Oil	53	0
Solar and Renewable Energy Technologies	457	148

Basic and Applied Research and Development (Millions of Dollars)
Source: U.S. Department of Energy FY 2007 Budget Request

According to Hodel and Deitz, "However important alternative sources eventually may be, our best estimate is that we will continue to meet our energy needs with oil and gas for at least the remainder of this and the next generation of Americans, and very possibly, several succeeding ones as well. Without some kind of energy breakthrough or aggressive government mandates, oil and gas appear certain to be our predominant fuels for the next 40 to 100 years." [36]

A broad range of parties assembled by the National Petroleum Council to assess the future of the oil and gas industry expressed "… surprisingly broad agreement …" on the outlook for the next 25 years, including, "The United States and the world will still be using large amounts of oil and gas in 2020, not significantly different from the more than 60 percent share of world energy consumption these fuels represent today." [37]

The case for redirecting R&D dollars to where they would prove more effective is especially important as government considers budget freezes and cutbacks. Past successes - including three-dimensional seismic, polycrystalline diamond drill bits and horizontal drilling - that have helped lower costs and improve recovery should be built upon.

To ensure that these limited resources are spent wisely, the IOGCC recommends the budgets for energy research and development be considered by the same congressional subcommittees. Current congressional structure requires fossil fuel and renewables research budgets to be evaluated in separate budget bills handled by separate subcommittees of the House and Senate Appropriations Committees. As a result, side-by-side comparisons of expenditures and impacts are difficult, and there is a lack of flexibility in allocating finite resources.

The NPC notes, "In the past three decades, the petroleum business has transformed itself into a high-technology industry … Looking forward, the domestic oil and gas industry will be challenged to continue extending the frontiers of technology. Ongoing advances in E&P productivity are essential if producers are to keep pace with steadily growing demand for oil and gas, both in the United States and worldwide. Continuing innovation will also be needed to sustain the industry's leadership in the intensely competitive international arena and to retain high-paying oil and gas industry jobs at home." [38]

In addition, the research issues of mature wells and of wells at the end of their productive lives must be addressed with government research. Well-plugging techniques, for example, are little changed in the last 50 years. Some attention needs to be paid to these issues and to assisting states with orphan well plugging and cleanup. An Orphan Well Fund was authorized in The Energy Policy Act of 2005, but has not yet been funded by Congress.

As a final recommendation, R&D activities should be well coordinated at the national level with a "Manhattan Project" type mentality that fully recognizes the urgency of our situation and the potential new technology holds for addressing it.

3. Re-examine federal and state policies as they relate to oil and natural gas development in consideration of new incentives for exploration and production.

In recent years, nearly every discussion of the status of the domestic oil exploration and production industry includes the description of the United States as a "mature producing region". As a result, the nation is increasingly dependent on imports from areas with more readily accessible oil." [39]

To assume that foreign oil is more accessible than domestic oil is fundamentally flawed and contrary to ensuring the nation's energy security. This assumption has led to ambivalence about the tens of thousands of small-volume wells in the United States that maximize recovery from known reservoirs. It has lead to ambivalence about developing the nation's offshore resources.

Two recent IOGCC publications, *Mature Regions, Youthful Potential: Oil and Natural Gas Resources in the Appalachian and Illinois Basins* and *Untapped Potential: Offshore Oil and Natural Gas Resources Inaccessible to Leasing*, counter the notion that the United States lacks more natural gas and oil resources.

In addition, onshore and offshore oil and natural gas resources in Alaska should be maximized. Alaska's successful regulatory track record supports the views of the majority of Alaskans that a small part of the Arctic National Wildlife Refuge – with billions of barrels of potential reserves – should be opened to petroleum exploration. In this regard, IOGCC applauds the administration's recent decision to open the North Aleutian basin to oil and gas development. Additionally, the vast majority of Alaskans in and around coastal areas adjacent to the North Aleutian have expressed support for expanded production. [40]

Despite the recent rhetoric by members of the 110th Congress, incentives to develop new resources have been extremely beneficial and cost effective. These include tax credits for the application of enhanced recovery techniques, which can produce up to 20 percent more petroleum. An incentive package for marginal wells in Texas is credited with prolonging production, generating significant tax dollars and recovering natural resources that would otherwise be lost.

Incentives led to commercialization of coal bed methane and other "nonconventional" sources, such as tight gas sands and shale gas, as sources of energy. Special provisions for heavy oil production also have yielded crude that in other circumstances would be abandoned.

The oil and natural gas producing states have attempted to assist the industry in reaching its full potential. The 2005 IOGCC study, *Investments in Energy Security: State Incentives to Maximize Oil and Gas Recovery*, found an array of state programs created to address current issues. States' responses to the needs of the petroleum industry are varied, but the most successful included common elements that ensured simplicity and highly targeted impact.

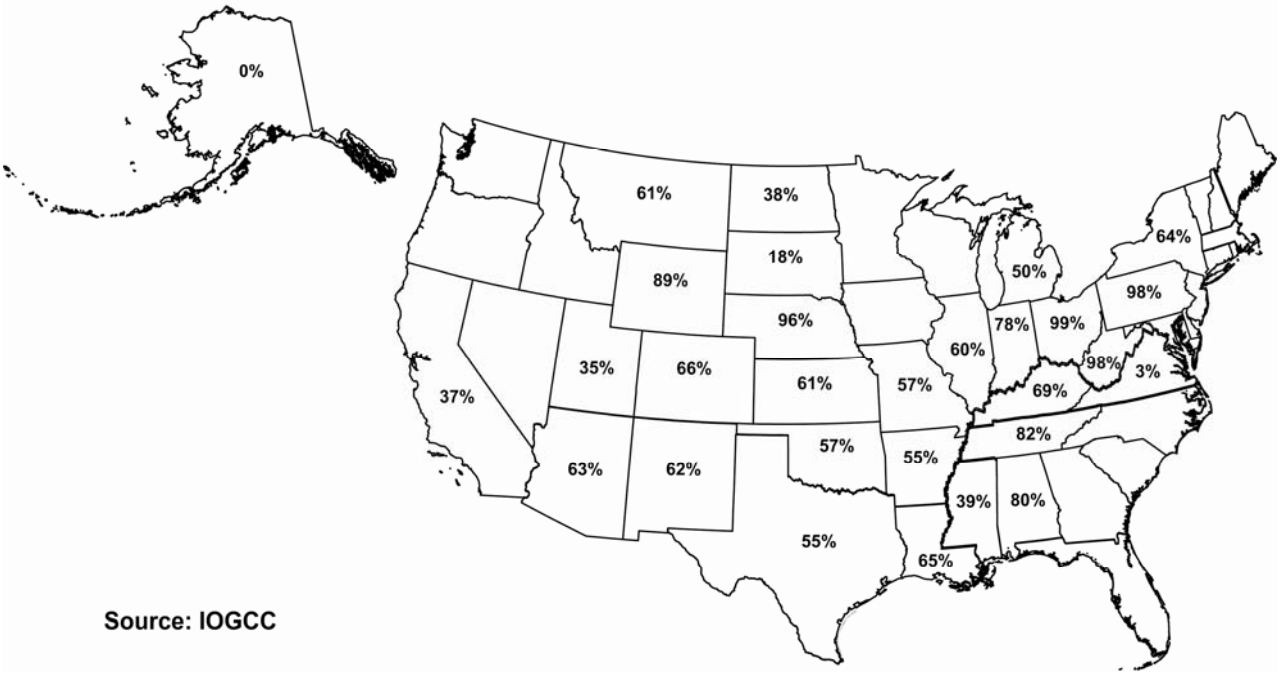
However, the federal government has eliminated many of its incentives for domestic production, and incentives for exploration virtually have disappeared. Accordingly, major oil companies, recognizing that the federal government seems willing to write off domestic resources, are choosing to spend billions of dollars overseas on exploration and production.[41]

Hodel and Deitz say, "The fact remains: public policy today works to the detriment of the domestic oil and gas industry."[42]

During consideration of legislation that became the Tax Reform Act of 1986, many of the incentives for exploration and production that the industry had utilized in its search for new resources were either eliminated or scaled back. Coupled with the collapse of oil prices that year, the loss of these tax incentives has helped to depress activity in the United States so severely that in 1999 the rig count reached it lowest level since the end of World War II. The combination of low prices and lost incentives caused cessation, postponement or cancellation of many enhanced oil recovery projects. With current robust prices, many shut-in wells are being returned to production, but others will never return. The high number of idle wells in some states needs to be addressed.

Other wells have been abandoned instead of plugged because the cost of plugging remained less than the costs of operation. Such marginal wells, producing 10 barrels or less per day, provide 16 percent of U.S. production and form a hedge against even greater dependence upon foreign crude oil imports (Figure 10). In its 2000 study, *Produce or Plug: The Dilemma Over the Nation's Idle Oil and Gas Wells*, the IOGCC reported that 343,030 wells were idle in the United States in 1999.[43]

Figure 10 - Stripper Oil Wells Proportionate To Total Number of U.S. Oil Wells (2005)



Source: IOGCC

Without action by state and federal regulators - who permitted temporary idling of marginal wells or prolonged plugging deadlines - perhaps thousands more of these stripper wells would have been abandoned. Once abandoned, these wells, their reservoirs, the remaining oil resources they contain, and access they can provide for advanced recovery technologies are, in effect, permanently lost to production or other service. With few exceptions, it is financially impossible to re-drill a three or four barrel a day well and expect to make up its development costs. It is also economically infeasible to re-drill these wells for future enhanced recovery purposes if the entire pool or field is already marginal.

Ironically, this is oil that already has been discovered, and reservoirs that already have been characterized. The known oil resources are enormous, as outlined in *"Mature Region, Youthful Potential: Oil and Natural Gas Resources in the Appalachian and Illinois Basins"*. [44]

A 1995 IOGCC report, *America's Untapped Oil*, estimated the total oil-in-place (known oil reserve) in the United States at 533 billion barrels. Only 182 billion barrels are considered salvageable under existing economic conditions. This leaves about 351 billion barrels as a target for new extraction technologies.

It is estimated that as much as 225 billion barrels are present in discovered and undiscovered oil reserves (enough to supply all U.S. oil needs for decades at the current rate of consumption). In addition, an estimated 1,800 Tcf of natural gas (enough to supply U.S. needs for hundreds of years at current consumption rates) have yet to be produced.

State and federal government counter-cyclical incentives that should be considered for either enactment or revival include:

- Allowing the deduction of no more than 50 percent of a taxpayer's income for certain oil and gas exploration and production expenses;

- An investment tax credit for exploration and development expenditures, stripper well operations, refinery expansion, and enhanced recovery project expenditures;
- Providing certain tax incentives for marginal wells and some limited tax credits for new domestic production;
- Unconventional oil development, such as oil shale, and unconventional natural gas development.
- Research investment;
- Training opportunities for workforce enhancement and urging state employment services to become engaged in job promotion, such as job fairs;
- Reduction in extraction taxes for extremely high-cost wells;
- State economic development departments establishing a relationship with the E&P industry;
- Refinery and common carrier pipeline capacity. Transparency should be provided for pipeline access to maximize competition;
- States providing a property tax holiday of 5-10 years for new refinery and common carrier pipeline capacity;
- State energy education programs for conservation;
- Depletion allowances;
- Strategic Petroleum Reserve.

The states have explored alternatives for maintenance of marginal well operations and have encouraged new or continued enhanced recovery operations. The states also have enacted a variety of E&P incentives, including reductions in severance or income taxes and initiatives that reduce administrative costs of oil and gas operations. Clearly the states also have a necessary role in addressing our nation's energy needs. Collectively, state governments can and should advance policies and programs to assist in new oil and gas E&P, which is in the nation's best interests as well as their own.

In a landmark 1999 study, *Against the Wind: The Economic Impact of Incentives During the Oil Price Collapse*, the IOGCC proved that incentives work to increase production and to generate substantial economic benefits. For an investment of $2.8 billion in reduced tax collections, states generated $75 billion in hydrocarbon production and expenditures to participate in the incentives. States benefited directly from $9 billion in state and local tax and royalty collections.

According to the study, "While it remains impossible to calculate how much of these economic effects are caused by the incentive programs, they still appear to remain 'profitable' for the legislatures investing the money. In a larger sense, the tax revenue stream pales in comparison to the beneficial effects on the economy. The $113.2 billion in economic effects creates $14.8 billion in salaries, which in turn yields 630,000 jobs (meaning years of employment). About one-third of these would be direct jobs in the oil and gas industry, while two-thirds would represent years of employment in other sectors of the state economy." [45]

Additional incentives for finding and developing the nation's reserves are possible as public policy recognizes that "mature" production and the nation's remaining oil producing regions should not be abandoned in favor of foreign sources. Recent reports by the IOGCC, the North American Coastal Alliance, and the Appalachian and Illinois Basin Directors reinforce this need.

Although incentives will prove helpful to preventing the waste of domestic resources, governments have recognized the need to increase the productivity and competitiveness of the gas and oil industry without compromising environmental protection. Regulatory barriers include

uncertainty shared by producers, pipeline owners, marketers, local distribution companies and end users. Market barriers also exist in perceptions toward the physical properties and use of natural gas.

While these barriers are gradually coming down, the processes are slow and uncoordinated. As a result, natural gas may be under-utilized as an appropriate fuel, and imports fill this need.

In response, federal agencies have pledged to "… enhance the efficiency and effectiveness of state and federal regulatory programs and reduce undue burdens on the domestic natural gas and oil industry by improving coordination among regulatory agencies, eliminating redundant or unnecessary regulation and avoiding duplication in state and federal regulatory programs." [46]

More work is needed in this area by the states and federal government. Governments have been slow to maximize the use of information technology in the oil and natural gas E&P area.

As a matter of policy, the IOGCC supports oil and natural gas regulation by the states, where differences in geology, climate and economic factors can be adequately considered. The "one-size-fits-all" nature of federal laws and regulations cannot efficiently deal with diversities in individual states, and actually discourages domestic production.

Examples of costly regulatory burdens include Superfund joint liability provisions, the financial requirements imposed by the Oil Pollution Act of 1990 (OPA 90), the Risk Management Program of the Clean Air Act Amendments and Enhanced Air Monitoring proposed by the Environmental Protection Agency (EPA).[47] In addition, EPA is continuing to look at regulatory expansions into areas already well regulated by the states. EPA has eyed expansion of its regulatory span in such areas as hydraulic fracturing, storm water runoff during the construction of the well site, and air emissions in the E&P sector.

Other areas of concern are Clean Air Act, NEPA, Endangered Species Act, and Clean Water Act. All result in lengthy administrative appeal processes that slow permitting and result in skewed energy policy when these excessive regulatory burdens are adjudicated.

When federal environmental laws are reauthorized, each must contain an analysis of the impact of the law on the nation's energy supply security and on energy consumers.

As an example, the OPA 90 Trust Fund needs to be examined by Congress and reviewed for effectiveness and the mission-focused use of the fund.

The IOGCC also has identified physical barriers to the expanded use of natural gas.[48] Among them are the inadequacy of existing pipelines, the lack of natural gas infrastructure (especially for natural gas vehicles), low capacity electric generation economics, a lack of necessary gas-flow information, lack of storage to meet peak demands and a lack of adequate supply and market pooling points.

The price picture has changed greatly since 2001 when the IOGCC noted, "Because of the fundamental advantages that natural gas enjoys over other sources of energy, in terms of price, environmental attributes and domestic security of supply, natural gas is poised to achieve its rightful role as the nation's dominant fuel. This vision, however, cannot be achieved in the near term if current trends are simply projected into the future. To realize stable deliverable supplies of natural gas, adequate transportation and expanded demand, existing barriers to the use of natural gas must be understood and overcome." [49]

The price of natural gas has moved dramatically during the last decade as this fuel became much more prominent in the U.S. fuel mix for electric power generation.

No discussion of domestic energy security is complete without considering government policy that limits E&P on public properties. While drilling in precious national parks and near beautiful natural treasures is always inappropriate, it makes no sense to allow valuable oil and natural gas reserves to remain untapped based solely on the perception that drilling and production technologies are inherently damaging to the environment. Thanks to proactive state regulatory programs, this is not the case.

Oil spills that capture news headlines are primarily a result of the bulk transportation of oil, not the process of E&P. Foreign oil imports arriving by supertankers represent a far greater risk to the environment than offshore drilling and production – even in environmentally sensitive areas.

Across the board, state and federal polices as outlined above must be re-designed to address our nation's oil and gas needs.

4. Encourage conservation of fossil fuel resources by the public and efficient production technologies.

An area in which the efforts of local, state and federal governments have been successful in the past is the encouragement of conservation by the public of fossil fuels. Advances have been made in building heating and cooling efficiency, and individual home use of energy has been made more efficient by utility-sponsored research through the Electric Power Research Institute and the Gas Technology Institute. State governments, utility industry groups and individual utilities have developed extensive programs to assist consumer conservation information.

Continuation of these efforts must be encouraged to avoid complacency on the part of the American public when fossil fuel prices are not affecting usage. Particular vigilance is essential in the conservation of liquid transportation fuels, which account for about 70 percent of the use of petroleum products.

A key to consumer conservation is energy education. For example, the direct conversion of natural gas for home heating, appliances and as a fuel for vehicles is far more efficient than the conversion of gas to electricity.

Consumers should be cognizant of their personal responsibility in energy consumption and ways to be a more responsible user. Consumers' choices of vehicles driven, manner of travel, speed and driving habits, recreational choices, living and work arrangements and personal consumption have an impact upon the nation's energy needs and security. Conservation and efficient use of the energy we have must be part of the solution.

The IOGCC recommends energy education that permits consumers to make choices based on conservation and the wise use of resources.

It also recommends that local governments examine their public transportation systems and ways to curtail individual automobile travel.

The IOGCC should work with the National Association of State Energy Officials (NASEO) to improve state government energy efficiency and continue to urge efficient use of energy at

federal facilities. (e.g. see Western Governors Association (WGA) "Clean and Diversified Energy Initiative" June, 2006).

5. Manpower Issue

The nation's domestic petroleum industry labor market currently is so tight that some scheduled exploration and production must be delayed to await the hiring and training of rig crews. The same tight labor situation applies to projects to re-work existing wells, or to undertake enhanced recovery projects.

Enrollment in petroleum-related majors at America's colleges and universities has shrunk for years and is just beginning to pick up again. The University of Oklahoma Mewbourne School of Petroleum Engineering has seen enrollment jump from 98 in 2003 to 224 in 2006. Like other schools, the university has engaged in an aggressive campaign to attract new students by securing corporate grants and establishing scholarships and internship programs.[50] On a national level, the number of bachelor's degrees awarded in petroleum engineering has grown from 260 in 2000 to 322 in 2005, while the number of geology degrees awarded has fallen slightly from nearly 3,500 in 2000 to 3,300 in 2004.[51]

The IOGCC has documented the labor problems and made detailed recommendations for state and federal governments and industry. Some of these recommendations from the IOGCC publication *The Petroleum Pros* have been followed. Others need to be addressed.

Shortages in the professional area include R&D specialists, as well as operational employees. The success of the domestic energy industry will depend on the ability of operating and service companies to attract significant numbers of well-educated and environmentally responsible skilled laborers who can construct and maintain the energy infrastructure needed to deliver low-cost, safe energy to our society.

The federal government is the largest resource owner in the United States and therefore must be actively involved in the solution to this labor problem. The government must commit its infrastructure and financial resources to this challenge to ensure that a long-term focus is brought to bear on the problem. The history of this labor market's huge cyclical employment swings does not condemn it to these swings in the future. This is a natural role for government, and is an urgent policy need that continues to be neglected by the federal leadership.

Such a long-term focus is essential to success because the industry alone is not capable of providing this convergence due to the realities of the modern marketplace. Our nation's leaders must work closely with industry and state governments to provide a regulatory framework that allows access to major reserves and encourages development over future centuries, while carefully protecting the environment.

State governments and agencies have critical roles in managing regional energy resources, providing local and regional regulatory structures, and in providing funding for major universities, secondary education, and vocational programs that will train the petroleum professionals of the future. Since The IOGCC *Petroleum Pro's* recommendations, many states have begun beefing up their technical training programs using state or federal workforce development funds to train lease operators, safety engineers, well service crews and other petroleum field technical skills.[52]

Academia must also continue to provide the educational and research infrastructure and environment that is required to train the large number of geoscientists, engineers and other professionals that are critical to the success of the industry. This role also must include providing continuity between undergraduate and graduate programs, and furnishing outreach courses for students who may not work directly in the industry but must receive a basic, balanced understanding of just how essential energy is to the health and prosperity of our society. The nation needs better consumers of energy products.

Industry must continue to engage fully in this effort. This includes continuing support for university programs such as the development of scholarships, internships and research partnerships. In addition, industry must step forward to give voice to its needs and potentials in securing the nation's energy future.

CONCLUSION

Crucial to the implementation of a national policy for oil and natural gas is the realization that increases in crude oil imports are expected to continue for the foreseeable future. Foreign oil is expected to provide 70 percent of U.S. demand by the end of 2010. The United States is no longer in the enviable position it enjoyed 50 years ago when it produced more than half of the world's oil.

Due to its high percentage of imports, the United States grows increasingly vulnerable to market manipulations by foreign countries that use oil not only as a source of economic wealth, but also as a political weapon. The Middle East has 10 times the known conventional reserves of the United States. As to unconventional reserves, the story is quite different - and that story needs to be communicated to the public and politicians.

The 1973 oil embargo reduced worldwide supplies by about 7 percent of pre-embargo consumption; prices increased dramatically (see Figure 3). A similar shortage that occurred after the Iranian revolution caused prices to triple; the surplus that occurred when OPEC decided to increase its market share in 1985-1986 drove prices back down to near the $12 per barrel level. In 1999, OPEC market manipulation drove the price below $10.

However, the war on terror and booming world demand have driven prices to their current levels. The concentration of production and reserves among Middle East countries again raises the specter of price gyrations and supply disruptions should certain nations choose to use oil as a tool for political gain.

In addition, the United States has committed to a future that relies on increasing the production of domestic natural gas. The many issues identified by the NPC – particularly access to resources and an emphasis on R&D – should provide a focus for policy makers who acknowledge the country's growing dependence on natural gas.

OPEC provides fresh reminders of its ability to manipulate markets. Spiking oil costs in 2006 had federal lawmakers desperately looking for quick fixes. As the price of oil fell in the early fall of 2006, national political attention turned away from the concerns of the summer. When the cyclical pattern of petroleum prices swings upward again, the "quick fixes" will again be trotted out for political fodder.

However, as Ruth Sheldon Knowles noted in her book *America's Energy Famine: Its Cause and Cure*, there are no quick fixes.

"We Americans are so psychologically geared to the idea of doing things quickly in a big way that it hardly seems possible that we cannot have a crash program to get us out of our predicament. In our bewilderment over our dramatically rapid change from an abundance of cheap energy to shortages of expensive energy, we have found it hard to accept the fact that there are no easy, quick answers."[53]

Not one of the proposals this report contains can be expected by itself to provide the stability necessary to maintain domestic production and a growing economy. Nor can one entity – a single state or the Congress – be expected to solve this problem single handedly. A national strategy calls for broad integrated participation. The recommendations within this report could minimize American dependence upon foreign crude oil and products by stressing domestic oil and natural gas exploration, development and conservation. The United States cannot afford to allow its future to be determined by other nations. The health of the economy and the ability for assured national defense cannot be maintained while crude oil prices fluctuate wildly.

The solutions to the real energy shortage, that of liquid transportation fuels, are years away. Renewable energy sources that hold promise will have only a minor impact in satisfying this growing demand.

The petroleum industry remains one of this country's most important, comprising from 3 percent to 5 percent of the economy. In 2004, the industry gave $10.3 billion in economic investment, which is an increase of about 2.5 percent from 2003. In the past five years, the oil and gas industry has invested $98 billion toward emerging energy technologies or 73 percent of the $135 billion spent by all U.S. companies and the federal government. The majority of these investments going to "frontier hydrocarbons" are research on tar and oil sands and heavy oil, making refineries more productive, and turning waste and residue hydrocarbons into more valuable products. The industry's health and the products it delivers are vital to the high quality of life expected by the public.

The federal mandate that deliberately constrains domestic resource development in areas such as the Outer Continental Shelf of California "is poor energy policy which artificially inflates U.S. imports ($56 billion for petroleum in 1994). It is poor government fiscal policy which abandons the stewardship role of maximizing the value of federal lands. It is poor economic and trade policy that discourages capital investments in the United States and the jobs and other benefits they create. It is poor environmental policy insofar as it moves production to areas of the world with less stringent standards of environmental performance."[54]

There is no indication that the federal government will act effectively to address energy issues. For example, the recent increase in gasoline prices fueled “crisis mentality” rhetoric that ranged from the proposed repeal of various taxes on gasoline to selling crude oil from the Strategic Petroleum Reserve to allocating hundreds of millions of dollars more for alternative energy research (aimed at electricity, not vehicle fuels).

The energy future for America is too important to be shaped by purely political gain. The states, acting through the offices of their governors, must participate in a national oil and gas policy based on economic development, maximizing domestic production, increasing access to potential reserves, promoting research and development and prolonging production from marginal wells to be implemented both at the federal and state level.

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MEMBERS OF IOGCC TEAM
OIL AND GAS POLICY EVALUATION FOR ENERGY SECURITY
(Resolution 06.052)

David Holt
Executive Director
Consumer Energy Alliance
Holt & Associates, P.C.
Attorneys at Law
2440 South Boulevard, Suite 10B
Houston, TX 77098
Phone 713.524.2622
Fax 816.273.8998
Cell 832.498.2451
dholt@dholtlaw.com

Victor G. Carrillo
Commissioner
Texas Railroad Commission
P.O. Box 12967
Austin, TX 78711-2967
Phone 512.463.7131
Fax 512.463.7161
Victor.carrillo@rrc.state.tx.us

Marc W. Smith
Executive Director
Independent Petroleum Association of Mountain States
410 17th Street, Suite 1920
Denver, CO 80202-4402
Phone 303.623.0987
Fax 303.893.0709
msmith@ipams.org

Don J. Likwartz
State Oil and Gas Supervisor
Oil and Gas Conservation Commission
P.O. Box 2640
Casper, WY 82602
Phone 307.234.7147
Fax 307.234.5306
dlikwa@state.wy.us

Robert W. Harms
President
Northern Alliance of Independent Producers
815 Mandan Street
Bismarck, ND 58501
Phone 701.255.2841
Fax 701.258.7733
harmsrbrt@aol.com

Maryam Sabbaghian
Staff Director
Energy and Mineral Resources Subcommittee
House Resources Committee
1626 LHOB
Washington, DC 20015
Phone 202.225.9297
Fax 202.225.5255
maryam.sabbaghian@mail.house.gov

Lynn D. Helms
Director
Oil and Gas Division
Industrial Commission
600 E. Blvd. Avenue, Dept. 405
Bismarck, ND 58505-0840
Phone 701.328.8020
Fax 701.328.8022
lhelms@state.nd.us

Shirley J. Neff
President
Association of Oil Pipe Lines
1101 Vermont Ave., NW
Suite 604
Washington, DC 20005
Phone: 202-408-7970
Fax: 202-408-7983
sneff@aopl.org

RESOLUTION 06.052

Oil and Gas Policy Evaluation for Energy Security

WHEREAS, America is blessed with a vast abundance of natural energy resources that have been critical to accommodating substantial population growth and fueling a dynamic economy. Oil and gas resources have been a key component to meeting the nation's energy needs for decades. Much of those resources are located in and developed throughout much of the western United States, but are also located throughout the nation; and,

WHEREAS, notwithstanding our rich domestic energy resource, our nation imports approximately 60 percent of our oil and approximately 3 percent of liquid natural gas from foreign countries. Americans are 5 percent of the world's population and consume 25 percent of the world's oil. Some of the regions from which we import these resources are at times politically unstable, creating unstable supplies, and volatile prices. Additionally, importing foreign oil and gas contributes enormously to our balance of trade deficit, which now exceeds $750 billion annually. Oil and natural gas imports represent approximately one third of the trade deficit; and,

WHEREAS, much of the United States economy and infrastructure is founded upon the use of oil and gas resources. The nation recognizes the need to diversify our energy supply, which will increase stability of the supply and price of our energy resources. Continued use and reliance upon oil and gas as a major part of the American landscape is likely for the coming decade, until new energy resources, technologies, infrastructures and strategies can be employed; and,

WHEREAS, 40 percent of America's energy needs are dedicated toward, or used in the transportation sector, much of which is supplied by crude oil; and,

WHEREAS, in recent years, we have seen a decline in the domestic oil and gas industry. In the downturn of the 1980s nearly 500,000 domestic jobs were lost. Likewise, experienced personnel throughout industry who remain are now approaching retirement age, and the industry is expected to loose nearly 50 percent of the domestic work force within the next decade; and,

WHEREAS, in 2005 hurricanes crippled much of the Gulf Coast drilling capacity and refining capacity, causing record high gasoline prices to exceed $3.00 per gallon; and,

WHEREAS, public reaction to recent gasoline and natural gas price spikes has been mixed, ranging from informed understanding regarding our nation's energy situation, to angry reaction toward the industry calling for investigations of alleged price gouging, to public policy changes that would negatively impact the industry; and,

WHEREAS, 35 states produce oil and gas in the United States, 34 of whom belong to the Interstate Oil and Gas Compact Commission, which is dedicated to the preservation of the state's rights and the development of oil and gas resources in an environmentally sound manner; and,

WHEREAS, many governors of the Western Governors Association (WGA) have served as Chairmen of the IOGCC, forging a relationship between the two organizations; and,

WHEREAS, oil and gas resources remains a topic in need of public policy development by the nation's governors. In recent years, oil prices have exceeded $70 per barrel and gasoline prices now approach or exceed $3.00 per gallon; and,

WHEREAS, although the market has responded to higher prices in some parts of the West, resulting in increased production of domestic resources through the use of new technology and new discoveries, infrastructure constraints limit the transportation and refining of new production. These constraints have resulted in artificially threatening continued new investment and development of new discoveries and also require solutions as part of our nation's energy needs.

NOW THEREFORE BE IT RESOLVED, that the IOGCC believes that a national forum for oil and gas issues, is essential for a well-informed public that understands the nation's current energy situation, potential solutions in the near term and those that will occur in years to come, and to avoid public policy choices that will exacerbate our nation's energy situation by discouraging domestic production;

AND BE IT FURTHER RESOLVED that an inventory of the nation's current needs, trends and policies be conducted to provide for more efficient use of our oil and gas resources, conservation practices of the resources, and policy changes that are necessary to develop and maintain the nations' oil and gas industry that will help provide a stable environment for the development and use of our nation's rich oil and gas resources.

AND BE IT FURTHER RESOLVED, that a joint project should be conducted between the WGA and IOGCC to:

- Conduct several regional forums throughout the West and the nation to hear from and provide information to the public on oil and gas issues.
- Convene a team of experts on oil and gas issues, including conservation and efficiency to provide the governors with recommendations for conservation, and development of the nation's oil and gas resources in an environmentally responsible manner.
- Provide the Governors with policy and other recommendations by December 2006.