RESERVES AND RESOURCES, SUPPLY AND DEMAND: WHY WE NEED CREDIBLE RESOURCE ASSESSMENTS

By

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A fundamental aspect of any energy policy is a credible assessment of the nation's energy natural resources. As a representative of the 30,000 member American Association of Petroleum Geologists (AAPG), I have been invited here today to testify as to the credibility of the oil and gas resource estimates of the United States Geological Survey (USGS) and Minerals Management Service (MMS).

Based on events this winter, there is clearly a critical need to address energy policy if our nation hopes to preserve its economic might, and continue to create jobs and wealth across our great land. A reliable supply of affordable energy is vital to our continued prosperity. The ability to access estimates of oil and gas supplies, reserves, and resources is essential for development of a sound energy policy and strategy by the federal government.

Let me begin with a few statistics prepared by the Department of Energy's Energy Information Administration (EIA), to put sources of energy supply in the proper perspective with regard to consumer demand:

Total US Energy Consumption by Primary Energy Source (1998)
Source: EIA Sept. 1999

Petroleum	40.7%	
Natural Gas	24.1%	
Coal	23.3%	(but 50.6% of all electricity)
Nuclear	7.9%	
Hydro	3.8%	
Other	0.3%	(geothermal, solar, wind, biomass, fuel cells)

I would like to emphasize that fossil fuels supply fully 88% of the nation's primary energy requirements.

In its Annual Energy Outlook (2001) Report, the EIA made the following projections regarding energy supply and demand over the next 20 years (1999-2020).

- GDP is expected to increase by 86%
- Total energy consumption will increase by 32%. Energy demand grew 20% since 1979, yet domestic supply increased by only 4.3%.
- Petroleum demand will increase by 62%
- Natural Gas demand will increase by 45%

- Coal demand will increase by 22%
- Electricity demand will increase by 45%
- Nuclear power will decline by 11%
- Despite a 37% increase in energy efficiency, crude oil imports will increase 40% to a total 64% of domestic supply, and petroleum product imports will increase by 148%

Given these significant increases in projected energy demand, and the electricity curtailments and natural gas price spikes of this past winter, the public must be assured that the nation can indeed supply the energy required to fuel our economy in the 21st Century. It is the job of the USGS and MMS to quantify the nation's energy mineral resources.

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS

The American Association of Petroleum Geologists was founded in 1917. It is the largest professional geological society in the United States, and has members worldwide. The membership is dedicated to the geological study of the earth and it's environment, and the exploration and development of hydrocarbon resources and other energy minerals. Because much of the membership is engaged, either directly or indirectly, in the search for hydrocarbons and the economic development of hydrocarbon deposits, the AAPG is keenly interested in understanding the amount and geographic distribution of hydrocarbon reserves and resources. AAPG advocates a comprehensive national energy policy based on sound science and knowledge of the nation's resources and reserves.

COMMITTEE ON RESOURCE EVALUATION

In 1993, the AAPG Executive Committee chartered the Committee on Resource Evaluation (CORE) to "provide input and facilitate U. S. Government agencies in performing assessments of U. S. hydrocarbon resources." The charter was amended in 1997 to include international assessments so CORE would have a worldwide view of hydrocarbon resources. Since inception, CORE has reviewed the methodologies and scientific methods used for assessments by the U. S. Geological Survey (USGS) and the Minerals Management Service (MMS). In several instances, CORE has made individual AAPG members with specific knowledge of certain geological provinces available to the agencies. To a lesser degree, CORE has offered opinions and technical information to the Energy Information Administration (EIA). For example, CORE supplied feedback to the EIA regarding its study of the economic impacts of the Kyoto Protocol on U. S. energy markets and made members with Deepwater Gulf of Mexico knowledge available to the EIA for consultation.

The Committee membership consists of employees of major petroleum companies, independent geologists, two directors of state geological surveys, three past AAPG Presidents, a member of the Potential Gas Committee (Colorado School of Mines), the Canadian Potential Gas Committee (University of Calgary), and the USGS. Although the membership is diverse, all are advanced in their careers and have a great deal of expertise in the science and technology of reserve and resource estimation. At most of its meetings, CORE has invited guests from the USGS, MMS, and other experts who can contribute to our knowledge of the nature, amount, and geographic distribution of potential petroleum resources, and yet to be discovered resources. CORE does not restrict its interest to conventional hydrocarbons but includes basin-center gas in continuous reservoirs, coalbed methane, shale gas, and some level of interest in gas hydrates.

Since it's formation, CORE has consulted with the USGS on its 1995 National Assessment of United States Oil and Gas Resources, the 1999 Arctic National Wildlife Refuge 1002 Area assessment, and the 2000 World Petroleum Assessment. For all of these, the Committee on Resource Evaluation has recommended to the AAPG Executive Committee that AAPG endorse the scientific methodologies and techniques used by the USGS, and the AAPG has publicly done so.

AAPG has not endorsed specific resource numbers generated by the assessments but has endorsed the sound scientific process used to generate the probability distributions.

RESERVES AND RESOURCES

Often people confuse or use interchangeably the terms "reserves" and "resources". Reserves are known, somewhat measurable, economic accumulations of hydrocarbons, and are readily available as supply to meet demand. Resources are potential, undiscovered, estimated hydrocarbons. The estimates are based on our current state of geological knowledge and existing technology. Whether resources are ever converted to reserves is dependent on economic conditions, policy decisions, and incentives for companies to perform exploration activities. As exploration proceeds and more geological data is collected, our ability to make better estimates of resources increases. Also, as resources are converted to reserves, supply increases and the ability to meet demand improves.

[Figure: Reserves vs. Resources]

This figure was developed jointly in 2000 by AAPG, the Society of Petroleum Engineers (SPE), and the World Petroleum Congress (WPC), and published by SPE. At the top of the figure, we define "reserves" as having been discovered, are commercial in nature, and are planned, undergoing development, or currently producing. We discuss them as being proved; proved plus probable; and proved plus probable plus possible; thus conveying a degree of certainty about the quantity.

At the bottom of the figure we define resources as undiscovered, of higher risk, and as plays, leads, or prospects. We discuss them in terms of low estimate, best estimate, and high estimate. These levels of estimation are driven by our geological knowledge, available data, and technology available to assess them. In order for resources to be converted to reserves and ultimately to supply, exploration has to take place. The exploration process consists of leasing acreage, acquiring and interpreting seismic and subsurface data, and drilling. Depending on location and the required permitting, this process can be conducted over a matter of months or even years.

In the middle portion of the chart is a category named "Contingent Resources." These are defined as hydrocarbons which have been discovered, but for which a commercial market does not exist. In earlier years of low natural gas prices, the gas cap at Prudhoe Bay could be considered a contingent resource.

As the debate over energy policy has developed we often see people confusing reserves and resources. An example is "ANWR is the biggest oil field left in North America." ANWR is actually a large estimated resource that will not be an oil field with quantifiable reserves (and part of the U. S. supply) unless the exploration process takes place.

SUPPLY AND DEMAND

Two other terms that need to be better understood are "Supply" and "Demand" as they pertain to oil and gas. In a *New York Times* article (10/17/00), Daniel Yergin said "I concluded that there were really just two characters who dominated the industry over a century and half: one named supply, and the other demand." In a 1997 AAPG position paper entitled "Energy Data and Analysis For a Sound Energy Policy", prepared by CORE, we defined supply as that quantity of hydrocarbons that is produced from existing wells in a given period of time. Demand is the amount of hydrocarbons that can be drawn from "supply" to meet existing energy needs.

The key idea to capture is that supply is limited to existing wells. As described earlier, it can take months or years to add new wells to bolster the supply. That is why it is so important for policy makers to understand the difference between reserves and resources. Resources cannot be

converted to reserves, and hence supply, by merely "flipping a switch" -- the process takes time. That is why industry needs reasonable access to federal lands to keep exploration moving forward.

We've all heard the argument that "ANWR would only satisfy six month's of U. S. energy needs." This is a fallacious argument that ignores the fact that, depending on size of a potential discovery, it might supply 15-25% of U. S. energy needs for 15-20 years. The truth is, it won't supply anything unless exploration takes place and resources are converted to reserves.

The figure below is an attempt to show those relationships. At the far left of the figure is where we start with Contingent and Prospective Resources. If the size of the resource is sufficient, and other factors such as the economy, prices, and technology are favorable, then industry is motivated to conduct exploration and convert the resources to reserves. Then if other factors are favorable, reserves are developed and become the supply. Hopefully, supply is sufficient to meet demand. Over the last few years, our industry has been wrenched when supply exceeded demand, and when supply failed to meet demand.

[Figure: Reserves and Resources/Supply and Demand]

U. S. ENERGY RESOURCES

AAPG believes the U. S. still has a large energy resource remaining to be tapped. We believe the techniques and scientific methods used by both the MMS and USGS are sound and provide a good basis for discussion of a national energy policy.

The most recent resource assessments of the USGS, MMS, EIA, and the National Petroleum Council (NPC) all confirm that the United States has huge remaining oil and gas resources.

According to the USGS, the technically recoverable onshore U.S. oil resource base is 110 billion barrels. This is five times our onshore and offshore proven reserve of 21 billion barrels. The United States consumes about 7 billion barrels of petroleum liquids per year.

The 1995 USGS assessment concluded that the United States has a remaining gas resource base in the Lower 48 States of 1,074 trillion cubic feet of gas (TCFG). It should be noted that only 135 TCFG, or just under 13% of the estimated resource, is considered proven. There are an additional 261.2 TCFG in Alaska; however, this gas is useless without a pipeline to the lower 48 markets. We presently consume about 22 TCFG/year. Even at a projected 32 TCFG/year consumption by 2020, there is more than a 33- year potential supply. Cumulative domestic production over the past hundred plus years is estimated to be about 890 TCFG.

The United States has the potential to be self-sufficient in natural gas supply well into the 21st Century. We have significant oil resources, but they are not likely to be adequate to satisfy future demand. However, unless the petroleum industry is allowed access to the areas where the remaining resources are located, the domestic energy "crisis" will become worse.

DISTRIBUTION OF THE RESOURCE

There are significant remaining known oil and gas resources in the traditional onshore producing areas of the Gulf Coast, West Texas, and in the Mid-Continent. However, these areas are now intensely drilled and blanketed with 3-D seismic, and are not yielding the large new discoveries required to replace the nation's depleting proven reserves. Major oil companies and large independents have been exiting onshore exploration, and moving their operations into the sparsely drilled waters of the Deep Gulf of Mexico and overseas. However, recent actual and proposed

acquisitions by BP and Shell may indicate a return to the onshore U. S. by the majors driven by the value of natural gas.

Many small oil and gas companies and the majority of the independent prospect originators are having trouble finding partners, as well as the capital, to drill the smaller reserve exploratory prospects that remain in the traditional producing areas. Higher oil and gas prices have significantly increased the drilling rig count; however, over 90% of the current drilling activity is for the development of known reserves.

Studies by the USGS and NPC have concluded that the most prospective areas for major new discoveries, particularly natural gas, are on public lands in the Rocky Mountain sedimentary basins, offshore in the Gulf of Mexico, in the Eastern Gulf of Mexico, and on the Atlantic and Pacific Outer Continental Shelf. The AAPG concurs with this assessment. Despite the huge potential of these areas, federal law presently prohibits exploration on the Atlantic and Pacific OCS and in the Eastern Gulf of Mexico. Access to much of the remaining resource potential of the Rocky Mountain basins is restricted or closed. The total estimated gas resource of these areas is 213 TCF (per NPC 1999 study) or a 9-year supply at current rates of gas consumption. It is likely that with further exploration, these resource figures would increase significantly.

The total area of the U.S. Federal offshore, including Alaska, to the 200-mile economic limit, is about 2 billion acres. Only 2 percent has been leased. In its 1995 study, the MMS assessed a mean undiscovered recoverable resource of 46 billion barrels of oil and 268 TCF of natural gas in the Federal OCS. This is 2.5 times the offshore reserve found to date. However, by a 1998 presidential directive, there is presently a federal moratorium on any exploration of the Lower 48 OCS outside of the Central and Western Gulf of Mexico until 2012.

In its 1995 National Oil and Gas Assessment of Onshore Federal Lands, the USGS estimated that the Northern Alaska province accounts for more than half of the of the undiscovered conventional gas assessed on onshore Federal lands. As previously stated, Alaska's total gas resources were cited in the USGS report as 261.2 TCFG. This represents a 12-year supply at current demand!

There is a huge domestic gas resource, yet access to much of this remaining resource is either closed or so restricted that development is not economically feasible or timely. As part of the policy making process, the public must understand that the United States actually has the gas resources to meet future demand. Congress then must determine if the public will support continued access restrictions, and if so, is the public then prepared to accept significantly higher gas prices and possible regional supply curtailments during times of peak demand.

ACCESS TO GAS RESOURCES ON FEDERAL LANDS

Natural gas is cited as a cleaner, more environmentally benign, energy resource to fuel our economy. However, access to the huge gas potential of undeveloped public lands is limited, in the Western states and on the OCS. Additionally, the federal regulatory maze hinders domestic petroleum exploration operations and investment.

With more than a decade of U.S. neglect in developing and implementing a comprehensive National Energy Supply Policy, and the environmental protection priority of the public, gas demand has caught up with, and probably overtaken, peak supply. This situation cannot be blamed on "Big Oil and Gas", nor the distribution companies.

The U. S. cannot depend on gas imports from OPEC to meet rising demand. Natural gas is a North American commodity that is locked into a pipeline delivery system. Imports from Mexico will be minimal. The 1999 NPC study projected LNG imports of less than 1% of supply through

2015. That same study projected U. S. gas demand in 2010 to be 29 TCFG on an annual basis and projected U. S. production to be 25 TCFG/yr. The shortfall, according to the NPC, will be made up by 4 TCFG of imports from Canada. What happens if the Canadian imports do not materialize? The United States must develop its own gas resources to meet future demand. This requires access to the public lands that are deemed most prospective for natural gas.

Conservation and renewable energy resources often are cited by as the solution to our energy requirements. This is not a realistic expectation if one appreciates the actual tiny magnitude of current alternative energy, and that fossil fuels supply 88% of our primary energy. Energy conservation has been effective in certain areas, particularly in regard to increased miles per gallon for automotive engines. Nevertheless, demand for transportation fuels continues to sky-rocket.

Despite DOE expenditures of over $9 billion since FY 1980 on solar and other renewable energy research, alternative energy resources provided only 0.3% of primary energy supply in 1999, exclusive of traditional hydroelectric power (3.8%). Obviously time and effort for research must continue on alternate energy resources.

The AAPG does not advocate any reduction in alternative energy research. However, the fact is, that our economy will continue to depend on fossil fuels for the majority of the nation's primary energy requirements for at least another generation. On April 18, 2000 at the AAPG Annual Meeting in New Orleans, Jay E. Hakes, Energy Information Administrator, presented a paper entitled "Long Term World Oil Supply". One of the conclusions in that paper was that with an estimated mean ultimate recovery of 3.0 trillion barrels worldwide, and production growth rates of 0-3%, the estimated peak year of world oil production would range from 2030-2075. That is over another century of hydrocarbons being a significant part of the energy mix.

NATURAL GAS FOR ELECTRICITY GENERATION

The rise in demand for natural gas for electricity generation has increased dramatically. The Gas Research Institute (GRI) in 1999 estimated gas consumption for electricity generation would increase from 3.8 quadrillion BTU's in 1985 to 5.2 quadrillion BTU's in 2000. They projected the 2015 level to be 9.1 quadrillion BTU's. For purposes of this discussion we can equate 1.0 quadrillion BTU's to 1.0 trillion cubic feet of gas. Over a 30-year period, gas consumption for electricity generation will increase about 239%!

The Gas Research Institute also projected the share of natural gas production that would be used for electricity generation to increase from 23.2% in 1998 to 33.1% in 2015. A full third of all gas produced and imported in the U. S. would go to electricity generation.

These projections are based on normal growth rates of supply and demand. Although the 1999 NPC study concluded that a U. S. demand of 29 TCFG in 2010 could be met, it required massive increases in capital, manpower, and infrastructure. The NPC study estimated $1.5 trillion would be needed to fund the industry from 1999-2015, the number of wells drilled annually would have to double from 24,000 in 1998 to 48,000 by 2015, and that 2,100 onshore and 180 offshore drilling rigs would have to be built. These figures would indicate a massive effort is needed to meet normal projected growth rates of natural gas demand between now and 2015.

However, lurking in the background is the proposed Kyoto Protocol agreed to by 160 countries to limit greenhouse gas emissions. Binding limits for emissions were set for 40 "developed" nations, with no limits imposed on the remaining countries. The U. S. goal is a 7% decrease in emissions relative to our 1990 levels. In order to achieve this reduction in emissions, a significant reduction in the use of petroleum liquids and coal is required. Natural gas will have to replace these fuels. The Energy Information Administration in its 1998 "Impacts of the Kyoto Protocol on U. S.

Energy Markets and Economic Activity" projected natural gas demand for electricity generation with the Kyoto Protocol in place at 12.7 TCF. Compare that with the 7.5 TCF estimated for 2010 without the Kyoto Protocol.

The EIA study also projected the gas price in 2010 with Kyoto in place to be $3.30 per thousand cubic feet ($/mcf). As consumers painfully experienced this winter, gas prices quadrupled, soaring over $10/mcf at one point. Implementation of the Kyoto Accord will put significant additional pressure on gas supply. Accordingly, a sound national energy policy must provide access to additional gas resources, and is going to have to promote the use of all fuels, including coal and nuclear energy, to meet projected energy demand.

RESOURCE ASSESSMENTS

The ability to access estimates of oil and gas supplies, reserves, and resources is essential for development of a sound energy policy and strategy by the federal government. In addition, many companies use these estimates to plan exploration and development strategies in the United States. Some of the agencies engaged in preparing such assessments also estimate international reserves and resources that can have an impact on foreign policy, national security, and understanding global supply and demand.

The agencies for the most part do a good job on these assessments using the geological data, scientific knowledge, and tools available to them. At times the agencies have been "behind" industry's thinking, especially in the area of new or evolving exploration plays (a "play" is a geological concept for exploration in a particular rock formation or geographic location). Examples of "hot" new exploration plays with huge oil and gas potential include: drilling beneath thick regional salt deposits in the Gulf of Mexico; production of natural gas from coal seams in the Powder River Basin of Wyoming; and drilling in the ultra-deep waters of the Gulf of Mexico OCS. As a result the assessments have sometimes been too conservative and have required subsequent revisions. Until these new trends were proven, the agencies assigned limited resources to them, and probably rightly so. Once these kinds of "frontier" plays have been discovered and proven by the risk takers of industry, the total resource impact can be assessed.

One of the characteristics of assessments we have discovered is their tendency to grow in size over time. This is due to increased exploration and gathering of subsurface data, improvements in geological knowledge, and acquisition of additional seismic data. As our knowledge of a basin increases, so does our ability to estimate its resources; which generally results in an increase in the size of the resource. That also is why exploration is so competitive. Different interpreters can look at the same data set, and draw dramatically different conclusions about exploration prospects. The figure below illustrates this point. It also illustrates the growth in reserve or field size as production occurs over time.

[Figure: Estimates of remaining natural gas in the United States]

Note the early 1970's estimates by M. King Hubbert of about 250 TCFG, and the almost ten times increase to 2,000 TCFG in 2000.

ANWR ASSESSMENT

In 1999 the USGS completed an assessment of the Arctic National Wildlife Refuge. The AAPG Committee on Resource Evaluation reviewed the methodologies and scientific techniques used by the USGS. The Committee did not review, or have any input into the actual resource estimates ultimately generated by the USGS. We concluded that the work of the USGS was scientifically sound, and that they had done a very good job of locating and wisely using all of the available data. This was

the first ANWR assessment where the USGS had access to proprietary seismic data. Although the AAPG does not routinely generate resource estimates, a 1991study chaired by AAPG past-president Robert Gunn predicted a mean resource for ANWR of 7.0 billion barrels of oil. This compares very favorably with the USGS 1999 estimate of 6.4 billion barrels for the un-deformed portion of the ANWR 1002 Area.

CONTINUOUS RESERVOIR ASSESSMENT

In the 1995 National Assessment of United States Oil and Gas Resources, the USGS assigned 358 TCFG to gas accumulations in "continuous" reservoirs. Continuous reservoirs are defined by the USGS as pervasive accumulations throughout a large area, which is not significantly affected by hydrodynamic influences, and lack well-defined down-dip water contacts. In other words, these deposits appear to be somewhat stratigraphic in nature, with little or no structural trapping, and produce gas with very little or no associated water. These reservoirs tend to be relatively impermeable sandstones, shales, coals, and chalks.

Such tight sandstone reservoirs are very prominent in many basins of the Western U. S. In its 1995 study, the USGS assigned 200 TCFG of recoverable resource to this type of reservoir in the Rocky Mountain Basins. The USGS is currently embarking on a reassessment of resources in this type of reservoir.

Given the recent events in California and the spotlight on natural gas for electricity generation, this could be one of the most important assessments the USGS will perform. A Subcommittee of the Committee on Resource Evaluation has already held meetings with the USGS to share ideas on the nature of continuous reservoirs, and probability distributions to best characterize the resource they contain.

AAPG ENERGY POLICY RECOMMENDATIONS

The United States has abundant energy resources. However we are now faced with a real energy crisis, because the nation has not developed and implemented a comprehensive energy policy. In order to assure that our way of life is not dramatically impacted because of energy shortages, the AAPG recommends the following:

- The U. S. must develop a national energy policy that provides dependable, affordable, and uninterruptible energy for the public and commerce, and is based on a sound scientific assessment of the nation's resources and reserves.

- Energy policy must address the needs of all-stakeholders – especially the consumers, and not over react to the demands of the shrillest interests with the most money for publicizing a particular position.

- Energy policy must be strategic and long-term, not "quick fixes" to short-term "crises".

- Energy policy must include a role for all energy sources, including coal and nuclear energy.

- Resources assessments are a vital planning tool for policymakers and industry. The agencies that perform these assessments and track oil and gas resources and reserves need continued support. They have done a good job to date.

- A major, long-term, and capital intensive energy industry effort is required to explore for, develop, produce, and build the infrastructure necessary to deliver the energy supplies required to meet projected demand. Energy policy must facilitate the process of capital formation and energy development, without creating costly and time-consuming regulatory roadblocks.

- Industry access to public lands, which contain hydrocarbon resources, should be a priority to encourage exploration for and production of domestic natural energy sources. We cannot become dangerously dependent on unreliable foreign energy imports.

- ***The public must be assured that energy resource development can be accomplished in an environmentally responsible manner. The technology is available to do this.***

- The impact of the Kyoto Protocol on the ability of the nation to supply the energy needed to fuel our economy without major disruptions must be carefully evaluated.

We look to the House Committee on Resources to take a leadership role in formulating a sound national energy policy, and thank you for giving the AAPG the opportunity to present its recommendations.

APPENDIX I.

ENERGY DATA AND ANALYSIS FOR A SOUND ENERGY POLICY

Energy is critical to all sectors of our economy and way of life. Data and analyses on supplies, reserves, and resources are critical to a prudent energy policy that provides for needed supply, wise use, and affordable prices. The American Association of Petroleum Geologists supports the continued efforts of the federal agencies responsible for collecting and analyzing such data.

The United States Government, appropriately, collects, maintains, and analyzes data to support the assessment of reserves and resources of energy commodities on an objective basis, chiefly through the Energy Information Administration of the Department of Energy, and the U.S. Geological Survey and Minerals Management Service of the Department of the Interior.

In times of budget constraints, some suggest that these basic data collection, assessments, and analyses can be eliminated, deferred, or significantly reduced from their current modest funding levels. Such action, however, would eliminate or severely reduce our national capability and adversely affect good energy policy.

Crude oil and natural gas are particularly important because they are the source of 65 percent of the nation's total energy supply. These sources can be described as follows:

Supply That quantity that is produced from existing wells in a given period of time.

Reserves The estimated amount that eventually can be recovered from existing reservoirs and fields under current technology and pricing conditions.

Resources The estimated amount that remains to be discovered based upon geological knowledge and exploration and development technologies.

Information about supply is available from both public and private sources. Regulatory agencies in producing states and federal regulatory agencies concerned with public lands commonly collect production data and make them available. At a national level, these data are collected, aggregated, and analyzed, and made available by the Energy Information Administration of the U.S. Department of Energy. Private companies also provide selected data organized in ways convenient for client usage.

Information about reserves is important to be able to estimate the quantity of future supply from existing production. Historically, the American Petroleum Institute (API) and the American Gas Association (AGA) developed this information on an annual basis. The "blue book", jointly produced by a committee of these trade associations, was considered a standard reference for such information.

Following the energy crisis of 1973, the Executive Branch and the Congress determined that information on supply, reserves, and resources was so vital to the development of sound public policy in meeting the nation's energy needs that the collection and analysis of such data should be done by a public entity. Accordingly, in the creation of the U.S. Department of Energy at that time, a quasi-independent agency, the Energy Information Administration (EIA), was established to collect, analyze, and disseminate a broad range of energy information to aid in the development of national energy policy.

The EIA developed a program that was implemented in 1978 to estimate annually the U.S. reserves of crude oil, natural gas, and natural gas liquids. This program was operated in parallel with the API/AGA "blue book" for five years to establish a connection with historical data for time-series

analyses. The EIA reserves estimation program has served the nation well for almost 20 years. The data collected and reserves estimated by this program are the only comprehensive source of such data for the U.S. As such, these data are used extensively by both public and private entities for a broad range of applications. Continuation of this program of developing estimates of reserves on an annual basis is a vital component of a sound public policy that addresses the nation's future energy needs.

Over the longer term, estimates of crude oil and natural gas remaining to be discovered are important for both public-policy decisions and private-sector business considerations. Such estimates provide policy makers with a view of the quantities of crude oil and natural gas that might be discovered through future exploration to meet a part of the nation's growing need for transportation fuel and other energy requirements. These data can be factored into policies that could encourage domestic exploration or the development of alternative energy supplies. These data also are important for the private sector in considering long-term plans for domestic versus international operations.

Estimates of resources have been made by various public and private sector organizations over the past several decades. Because of the important policy considerations attendant to such estimates, the Congress has requested that the U.S. Geological Survey and the Minerals Management Service provide such estimates on a periodic basis for the onshore lands and in state waters, and the offshore public lands, respectively. The U.S. Geological Survey recently completed a national assessment, and the Minerals Management Service will soon release a report on their area of responsibility.

Resource estimates conducted by the U.S. Geological Survey and the Minerals Management Service are important activities that need to be continued in future years. Likewise, reserve estimates conducted annually by the Energy Information Administration also are important in support of sound public policy. This nation's energy policy can be no better than the basic data and analyses on which it is based. Therefore, the American Association of Petroleum Geologists urges that the Congress and the Administration continue to support these important activities.