Red Cavaney
President and Chief Executive Officer

1220 L Street, NW
Washington, DC 20005-4070
USA
Phone 202-682-8100
Fax 202-682-8110
Email rcavaney@api.org
www.api.org

The Honorable John D. Dingell
Chairman, Committee on Energy and Commerce
United States House of Representatives
Washington, DC 20515

The Honorable Rick Boucher
Chairman, Subcommittee on Energy and Air Quality
United States House of Representatives
Washington, DC 20515

Dear Chairman Dingell and Chairman Boucher:

On behalf of the API and its members, I am pleased to respond to your inquiry of February 27, 2007, on the complex issue of climate change and the challenge facing the Committee in addressing this issue in a comprehensive, constructive and creative way.

API and its member companies consider climate change a very important issue. Even as research and policy debates continue, our member companies are addressing climate change in diverse ways, including taking actions now to reduce greenhouse gas emissions and investing in, and developing, technologies that will reduce them even more in the future. While API supports voluntary, technology-based approaches that have produced substantial progress towards addressing greenhouse gas emissions; API nonetheless believes that all stakeholders should remain open-minded, and that all policies to address climate change should be carefully considered in a public, transparent and informed debate. API also supports further public education regarding all aspects of climate change policies, and plans to remain actively engaged with the Committee in discussions of any climate proposals.

We are continuing our own efforts to understand the complexities of this policy matter and seek constructive avenues for making progress on the climate issue. In the meantime, we stand ready to answer any questions you may have on this submission and look forward to cooperating with the Committee.

Sincerely,

cc: The Honorable Joe Barton, Ranking Member
Committee on Energy and Commerce
The Honorable J. Dennis Hastert, Ranking Member
Subcommittee on Energy and Air Quality

An equal opportunity employer

INTRODUCTION AND EXECUTIVE SUMMARY

API welcomes this opportunity to respond to the House Energy and Commerce Committee's questions of February 27, 2007, and looks forward to engaging constructively and positively to address the challenges of climate change. API represents nearly 400 member companies engaged in all aspects of the oil and natural gas industry, including exploration, production, refining, distribution, marketing, research and development. Our member companies are also investing and leading in the development of renewable and alternative energy sources and advanced energy technologies.

API and its member companies consider climate change a very important issue. Even as research and policy debates continue, our member companies, which are competitive and unique, are addressing climate change in diverse ways, including taking actions now to reduce greenhouse gas emissions, and investing in and developing technologies that will reduce them even more in the future. While API supports voluntary, technology-based approaches (which have produced substantial progress towards addressing greenhouse gas emissions), API nonetheless believes that all stakeholders should remain open minded, and that all policies to address climate change should be carefully considered in a public, transparent and informed debate. API also supports further public education regarding all aspects of climate change policies, and plans to remain actively engaged with the Committee in discussions of any climate proposals.

For our energy security, Americans will need to have reliable and affordable supplies of oil and natural gas, as well as other energy sources, to meet increasing demand and ensure economic growth. Of total U.S. energy use, 40% comes from oil and 23% from natural gas. With future economic growth, consumer demand for energy is expected to grow. Even with increased energy conservation and use of alternative fuels including renewables, the Department of Energy (EIA) estimates that consumers will need 28% more oil and 19% more natural gas in 2030 than in 2005. In addition to transportation, heating and cooling, oil and natural gas are used to make indispensable items like medicines, fertilizers and fabrics. These resources are woven into the fabric of American life. In considering legislation, the Committee must carefully and comprehensively examine the potential environmental, economic and energy security impacts of climate policy proposals. The Committee should examine the costs of these resources, our ability to provide adequate supplies of oil and natural gas, and the implications for the economy, jobs, and international competitiveness. The Committee should also consider that demand for these resources will be met in an increasingly globalized marketplace for both oil and natural gas. All of the potential costs and the potential benefits of different climate change proposals should be communicated openly and clearly to the American public.

API believes that any climate change policy should:

- Avoid severe damage to the U.S. economy, as Congress and the Executive have previously determined;
- Keep U.S. energy production competitive in the global marketplace, and avoid outsourcing businesses, jobs and energy production, and displacing emissions overseas;
- Promote a positive investment environment, including incentives, for rapid development and deployment of energy efficient and emission reduction technology;
- Provide access to all domestic energy sources, including natural gas, which will face increased demand under potential emission limits;
- Be transparent and understandable to consumers and all stakeholders; and

- Carefully consider the potential consequences (high costs for potentially negligible benefits) of any policy that would make energy producers responsible for emissions of energy consumers, even if such a system might be administratively simpler.

Response to Question 1:
Congress has frequently addressed climate change, reflecting its legislative goals and policies. Congress has also authorized new laws and millions of dollars in appropriations to address climate change and develop low-emission energy sources. As you consider additional legislation, API believes that the Committee should not overlook the laws already enacted and substantial progress made under those laws, including the Energy Policy Act of 2005 (EPAct). For examples, please see EPAct Title 16 and further Responses to Question 3.

Although the Committee's letter did not propose any specific legislation at this time, API would like to identify issues we believe the Committee should carefully evaluate before drafting any additional climate change legislation. The potential wide-ranging impacts of new climate change legislation on the national economy, U.S. energy supplies, energy security, energy consumers, and on the general public are so broad and significant that Congress should take the time necessary to identify, consider, and address them carefully and deliberatively. Rather than propose a specific timetable, API believes it is more important that Congress consider appropriate, cost-effective responses to the long-term global challenge of climate change rather than advance ineffective or potentially harmful legislation.

API members already are participating in voluntary approaches as reflected in the API Climate Challenge Program. These approaches are technology-based and include energy efficiency and conservation as major components, as a means to promote cost-effective actions to address climate change. However, all policies to address climate change should be carefully considered. A key concern expressed consistently by Congress, the Executive and many other stakeholders has been to avoid severe damage to the U.S. economy posed by mandatory policies containing unrealistic or cost-ineffective near-term emission targets. API plans to remain actively engaged as Congress debates the climate change issue.

API encourages the Committee to recognize that any approach to mitigating greenhouse gas emissions is likely to increase demand for clean-burning natural gas. Therefore, an important first policy step in any event should be to increase access to all sources of energy from our vast North American resources, onshore and offshore, including natural gas, and to assure the availability of infrastructure support for import and distribution.

Overall, API supports the following principles as elements of any sound approach to the long-term challenge of climate change:

- Promote advanced, energy efficient technologies and carbon sequestration options as part of a long-term, cost-effective strategy, without government selection of "winners and losers;"
- Encourage the rapid development and adoption of energy-efficient technologies and enable accelerated capital stock turnover by addressing legal, fiscal and regulatory impediments to such technologies;
- Identify and expand cost-effective, near-term voluntary actions to mitigate GHG emissions;
- Support economic growth and avoid damage to the economy posed by cost-ineffective policies that would involve unrealistic, near-term emission targets and timetables;
- Export advanced, energy-efficient technologies to the developing world through financing incentives and reduced export barriers, while protecting property rights;
- Promote global participation, particularly by developing countries such as China and India, to address this global challenge cost-effectively;

- Explore the dissemination of 'best practices' in emission reduction techniques and systems to assure that companies are not disadvantaged later for their current voluntary actions; and
- Continue to advance scientific understanding of global climate change in order to calibrate and adapt future policies appropriately and effectively.

In addition, API urges the Committee to consider the following important issues when evaluating different legislative proposals:

- Consumer Decisions (Transparency). Any new climate change policies should provide open, transparent, uniform and predictable signals to consumers and companies to inform near term consumption decisions and long term investment decisions across the economy. In order to provide effective incentives to energy end-users – the people who make the decisions on purchasing cars, appliances, and capital equipment and how that equipment is used – any legislation needs to be transparent. It is not clear, for example, how a cap/trade program would provide useful information to the motorist who is also facing the impacts at the pump of fluctuations in world oil costs. Without changing consumer behavior, the actual cost of significantly reducing emissions will likely be far greater than intended. Any policies should aim to achieve results cost-effectively with minimum overall impact on the US economy.
- State Programs. The interaction of any potential national climate proposal and potentially inconsistent state programs needs to be carefully assessed with regard to cost-effectiveness, equity, and impacts on interstate and international commerce. Given our industry's experience with state-specific "boutique" fuels requirements, there is great concern about the potential for a patchwork of State climate change programs with different, possibly conflicting requirements and how these could impact energy reliability and affordability.
- Equitable Treatment of Emissions. Equitable treatment of emissions from all sources of greenhouse gases throughout the economy – as far as possible – is essential. The burden of legislation should not fall disproportionately on any particular industry, source or group of sources of greenhouse gases. A primary goal should be to achieve emissions abatement cost-effectively, with the minimum overall impact on the economy.
- Technology Transfer. Any new policies should promote frameworks for technology transfer in recipient countries, including protection of property rights.
- Carbon Capture and Storage. The potential contribution of carbon capture and storage (CCS) to addressing climate change in the long-term should be enhanced. In particular, CCS holds promise to allow the United States to continue to benefit from utilization of abundant domestic reserves of coal in power production. However, substantial challenges in policy, logistics, technology and economics must be addressed before widespread use of CCS is possible. Most importantly, there is no current system to assign responsibility for the long-term storage of CO_2. Failure to resolve the question of long-term liability successfully will affect the development, cost and timing of CCS investments. An appropriate regulatory regime for CCS also should address requirements for site selection, monitoring and operation of sequestration facilities. At the same time, any new CCS regulation should not impede current sour gas (H_2S) disposal or use of $C0_2$ for enhanced oil recovery activities, which have a successful track record and contribute to increased domestic oil production and reduced imports.
- Additional Energy and Fuel Requirements. The effectiveness of any potential mandatory technology requirements, including any prescriptive fuel regulations, needs to be evaluated in regard to current fuel requirements and infrastructure challenges, such as those facing biofuels today. Additional fuel mandates or requirements would be especially challenging given that companies are now trying to implement the new fuel requirements under EPAct. Research and development on breakthrough technologies for fuels is well underway but not yet ready for commercialization on a large scale. The size and scale of our nation's fuel system is significant.

For example, everyday consumers depend on a reliable supply of about 380 million gallons of retail motor gasoline (under a variety of requirements), 58 million gallons of jet fuel (commercial and military), and 170 million gallons of distillates, which are used largely for diesel and heating oil. Therefore any significant changes would have major implications to our ability to supply energy. Similarly, the potential impact of any future, non-climate related, fuels requirements on the overall level of greenhouse gas emissions should be evaluated whenever such requirements are considered.

- Effects on Alternative Fuel Sources. Renewable fuels will play an important role in meeting our nation's energy challenges in the 21st century. For example, API members are investing heavily into research efforts for second-generation cellulosic ethanol technology, which is essential to substantially increasing biofuel use for the future. However, measures that require or result in increased demand for biofuels as an alternative energy source – beyond that driven by normal market forces and existing legislation – should consider full life-cycle impacts. This would include the CO_2 generated from "farm to wheel," competition between food and fuel, water use, land use and availability; deforestation; and the need for the infrastructure supplying such biofuels.
- Potential Outsourcing of Jobs and Emissions. Any proposals that would impose greenhouse gas emission limits in the U.S. need to take into account the likely consequences of outsourcing of jobs, investments, economic opportunities and emissions overseas.
- Accurate Measurement Methods. Any policies to address greenhouse gas emissions should include all sources on an economy wide basis. However, the effectiveness of any greenhouse gas reduction policy depends upon accurate and uniform measurement of emissions, even if methods differ from sector to sector. While it may not be possible to achieve emissions estimates in the short term that are uniformly reliable across all sources, a credible and accepted estimation method for all emitting sectors should be a goal, and is necessary for managing and evaluating results of any proposed policy.
- Energy Efficiency and Conservation. API feels strongly that energy efficiency should be an important part of our nation's energy and climate policy, and that individuals, businesses and government all share in the responsibility to conserve and use energy wisely. API members are doing their part, as outlined in response to question 5 below. Our nation should continue to pursue opportunities to improve energy efficiency across all sectors, including in buildings, transportation, manufacturing and by consumers as a means to address climate change.
- International Programs. Any U.S. program should take account of any international programs, and incorporate lessons learned from those programs.

Response to Question 2:

Although cap and trade policies of various sorts (downstream, upstream and with or without a safety valve on price) have received substantial attention, there are numerous other policies that have received less analysis. Without pre-judging the outcome, a serious approach to climate change legislation merits a thorough analysis of all policy alternatives (e.g., voluntary programs, cap-and-trade system, and a carbon tax) and their effects on the environment, the economy and individual sectors of the economy. API member companies are competitive and unique, and are addressing climate change in different ways and evaluating a wide variety of policy approaches. As stated previously, voluntary, technology-based actions have produced significant progress towards addressing greenhouse gas emissions. Nevertheless, API believes that all stakeholders should remain open minded, and that all policies to address climate change should be carefully considered. API is concerned about any policy that would have adverse impacts on consumers, economic growth and energy costs, specifically on oil and natural gas reliability and affordability. API intends to continue to engage constructively and positively to address the challenges of economic progress, energy security and climate change.

a.

Under any effective system, costs of GHG mitigation would be minimized to the extent that the system is economy-wide and covers the broadest array of emissions sources. In principle, all sectors and sources should be covered subject to the need for effective, reliable emissions accounting. The determination of covered sectors should avoid having the government predetermine sectors that are "winners" and "losers" through inequitable, disproportionate and non-transparent requirements. Under any approach, sectors should not be held responsible for factors beyond their control. In regard to transportation fuels, individuals and businesses decide which vehicles to buy and how much to drive, and determine transportation emissions, all of which are factors beyond the control of fuel producers. In any event, the Committee may need to consider the unique characteristics of different sectors.

b.

Any broad proposal to limit or cap greenhouse gases would directly impact energy supplies and use throughout the economy and those impacts would depend critically on the detailed structure of the proposal. For that reason, Congress needs to carefully assess the potential impacts of the details of any proposal utilizing the best information available. A transparent understanding of the potential costs and benefits of mitigating climate change is essential to all stakeholders, including legislators, regulators, consumers, and businesses, especially given the magnitude of potential costs and who will bear those costs. This is especially important given the possibility that costs, in terms of economic impacts, could fall unevenly across different regions of the country and on different income groups. As it relates to oil and natural gas consumption, Congress should take into account the effects of concurrent policies that address environmental concerns (whether climate-related or not), including tighter fuel specifications or other mandates. For example, the new, more stringent standards for ultra low-sulfur diesel fuel require refineries to consume more energy to produce the same quantity of diesel fuel for consumers.

c.

There are various alternatives to possible compliance points under any potential cap-and-trade approach, all of which require further analysis. Some climate policy proposals would hold energy producers responsible for both operating emissions from producing fuels, and consumer emissions from using the fuels in transportation (an "upstream" approach) while others would hold each sector responsible only for its own emissions (downstream" approach). These and other approaches raise serious issues that should be carefully considered, including administrative simplicity, cost-effectiveness, disproportionate allocation of allowances, price volatility, transparency to the consumer and potential outsourcing of domestic energy sources. For example, individuals and businesses – not energy producers – decide which vehicles to buy and how much to drive, and thus determine their own transportation emissions. EIA analysis demonstrates that assigning new permit costs to fuel producers *for consumer emissions* results in increased fuel costs but little change in consumer behavior that reduces CO_2 emissions. Moreover, under an upstream approach, long term U.S. energy investments with high investment costs, such as refineries and natural gas plants, could become economically more risky and less competitive with foreign sources, given potentially wide swings in emission allowance fees multiplied by the high volume of consumer transportation emissions, which fuel producers cannot control. Since those new costs would be imposed only on U.S. facilities, industries and consumers that rely on those sources for a fuel or a feedstock potentially would increase their reliance on foreign sources. Whatever approach is considered, care should be taken to not inadvertently harm domestic energy production and investment.

d.

Allowance allocation systems present deep issues of equity and potential for unfair apportionment among and within sectors. Equitable, cost-effective and transparent treatment of emissions from different sources of greenhouse gases throughout the economy is vital, and the burden of legislation should not fall disproportionately on any particular source or group of sources of greenhouse gases. A primary goal of

any allocation scheme should be to minimize the overall cost to society of greenhouse gas mitigation and thus should take account of any lessons learned from any existing allocation systems.

e.– f.

The United States has an EIA projected population growth of 37 million people by 2020 and another 28 million people by 2030. With the expectation of improvements in living standards, setting a hard emission cap without identified, cost-effective technologies for reaching that cap raises serious questions of potential policy failure. A policy failure of significant magnitude could seriously set back efforts to address climate change. The relative strengths and weaknesses of a GHG-intensity metric versus other types of metrics should be thoroughly evaluated before any dates or specific caps are considered

g.

Any program addressing climate should consider all relevant greenhouse gas emissions from sources throughout the economy should be addressed, subject to reliable and consistent means for estimating emissions. Efforts should be undertaken to develop reliable emissions estimation tools for any greenhouse gas source without such tools.

h.

As stated in response to Question 1, companies should not be disadvantaged for current voluntary actions. API would be willing to discuss appropriate criteria for determining what constitutes an "early reduction" if and when it is appropriate.

i.

Congress has often recognized that cost-effectiveness is an important factor in setting or meeting environmental goals and requirements, and the "safety valve" concept is one way of addressing cost-effectiveness issues that should be considered in evaluating any climate proposal. (A carbon tax concept is another possible approach to dealing with cost-effectiveness issues.) In an insightful analysis of different mechanisms for limiting greenhouse gas emissions, Dr. Nordhaus of Yale University raises several important points about cap/trade mechanisms, especially those without safety valve limits on allowance prices.

According to Dr. Nordhaus:

> "Closely related to the point about uncertainty is that quantity-type regulations are likely to show extremely volatile prices for the trading prices of carbon emissions. Carbon prices are likely to be extremely volatile because of the complete inelasticity of supply of permits in the quantity case along with the presumption of quite inelastic demand for permits in the short run.
>
> "We have preliminary indications that European trading prices for CO_2 are highly volatile, fluctuating in a band and $\pm$50 percent over the last year. More extensive evidence comes from the history of the U.S. sulfur-emissions trading program. SO2 trading prices have varied from a low of $70 per ton in 1996 to $1550 per ton in late 2005. This is analogous to a carbon-trading program because the supply is virtually fixed and the demand is inelastic because of the low substitutability of other inputs for sulfur in the short run. Both programs build in some banking features, which can in principle moderate price volatility.
>
> "Such rapid fluctuations would be extremely undesirable, particularly for an input (carbon) whose aggregate costs might be as great as petroleum in the

coming decades. An analogous situation occurred in the U.S. during the "monetarist" period of 1979-82, when the Federal Reserve targeted quantities (monetary aggregates) rather than prices (interest rates). During that period, interest rates were extremely volatile. In part due to the increased volatility, the Fed changed back to a price-type approach after a short period of experimentation. This experience suggests that a regime of strict quantity limits might become extremely unpopular with market participants and economic policymakers as price variability caused significant changes in price levels and import and export values." (See William D. Nordhaus, "After Kyoto: Alternative Mechanisms to Control Global Warming", Yale University, December 6, 2005.)

Employing a safety valve is one way to address the concerns raised by Dr. Nordhaus, and should be considered, along with other options, to help minimize the societal costs of emissions mitigation and help avoid some of the effects of a volatile emissions allowance market.

j.

Climate change is a global issue and emissions in developing countries are growing rapidly. By 2014, EIA projections indicate that emissions from all developing nations will exceed those of all developed nations. Thus, while Congress considers whether to adopt mandatory emissions controls for the U.S., it should consider that developing nations, while increasingly considering the environmental consequences of their economic growth, have no obligations under existing climate change treaties. Offsets through investments in this country and especially in developing countries, may provide a way to achieve globally cost-effective greenhouse gas emissions reductions and at the same time promote clean and sustainable development abroad. However, procedures for offsets have to be carefully managed so they do not limit the positive contribution offsets can make to a global effort to address climate change. API is prepared to contribute to efforts to develop procedures that will qualify appropriate investments based on efficient, transparent, effective procedures.

k-l.

Given the long-term nature of the climate change issue, and the likely high-value of fundamentally improved technologies to improve living standards while also addressing greenhouse gas emissions, a significant increase in government funded and/or government-private sector pre-commercial research partnerships should be considered. Some have proposed DARPA-type climate change research (Defense Advanced Research Projects Agency) while other options for encouraging technology development exist and could be considered Some examples are research and development to accelerate the creation of more efficient and low GHG emitting technologies, providing relief to income groups negatively affected by the regressive impact of climate policy, and recycling revenues to promote economic growth by providing relief from other distorting taxes. At the same time, "picking winners and losers" by favoring one sector of the economy over another needs to be avoided.

There is a need for targeted programs to promote long-term, fundamental, pre-commercial R&D for breakthrough technologies. Such programs should aim to build R&D capacity in universities and by training a new generation of engineers and scientists to address technology needs in coming decades. In addition, policies should promote a positive investment environment, including incentives, and appropriate tax incentives that would encourage more and faster technological research and development. Conversely, any climate policies that would unduly harm the U.S. economy would discourage new investments in both technology R&D and efficient, existing capital projects by reducing the financial and human resources that could be devoted to technological development.

m.

Please see Response to Question #4.

Response to Question 3

Existing joint government-private sector voluntary efforts have contributed significantly to mobilizing industry to address climate change and to the nation's progress in reducing greenhouse gas emissions intensity.

Programs like EPA's Natural Gas STAR, Climate Leaders, and DOE's ClimateVISION, have promoted the development of broad sector voluntary programs as well as company specific actions. More recently, the EPAct has established a positive path to reducing greenhouse gas emissions. Specifically, EPAct established $11.5 billion in potential clean technology tax incentives. Assuming these are fully funded by Congress, these incentives have and will continue to encourage investment in new, more efficient technologies that can improve productivity while reducing greenhouse gas emissions per unit of output. The incentives have led to greater use of renewables, as well as technologies that reduce the emissions from traditional energy sources. Further, EPAct supports technology research development and demonstration projects, many in partnership with U.S. industry.

The results of voluntary actions have been impressive. A look at recent GHG intensity trends (from the EIA 2004 International Energy Outlook) shows that the U.S. has been among the top performers in the world, reducing GHG intensity by over 2% per year from 1993-2002. Even more impressive, for 2002-2004, U.S. GHG intensity improvements remain at about 2% per year, while much of the developing – and developed – world has trended in the wrong direction.

Further, GHG intensity will continue to decline as the U.S. becomes more efficient and new technologies are commercialized. According to the DOE Energy Information Administration's 2007 Energy Outlook, between 2005 and 2030, U.S. economic growth is expected to increase at a much higher rate than CO_2 emissions. <u>The expected result: a one third reduction of CO_2 emissions per every dollar of GDP.</u> These projections assume that voluntary programs will continue throughout this period.

Both current and future emissions trends indicate that policies encouraging voluntary programs are an efficient means to address GHG emissions. In contrast, while it is too early to fully determine the effectiveness of the EU's emissions trading program, their initial efforts have highlighted the complexities and concerns raised by a cap-and-trade program.

Response to Question 4:

Congress and the Executive Branch have previously indicated that any U.S. climate policy must be predicated on actions from all nations to do their part. According to the Energy Information Administration, developing nations' emissions will surpass developed nations' emissions by 2014. China alone is projected to surpass the U.S. in CO_2 emissions in 2009. However, neither the Kyoto Protocol nor any other international agreement requires developing nations to reduce emissions even though they compete for trade and jobs. U.S. policy should continue to promote and support reasonable, cost-effective actions by developing countries. The effects of the policy might be improved, for example, by encouraging more actions to promote protection of intellectual property and elimination of investment barriers in order to qualify for investments that generate offset credits.

To date, the U.S. has launched 15 bilateral and regional partnerships on issues ranging from climate science to energy and sequestration technologies and policies. Countries covered represent approximately 80% of global GHG emissions. Given the global nature of climate change, the U.S. should continue to emphasize the participation of all countries in international climate policy, and these 15 programs represent a significant step to engage the global community. In the absence of any mandatory programs

by developing nations, such voluntary programs currently represent the best opportunity for the U.S. to engage these essential partners in addressing climate change.

For these very reasons, the US, Japan, Australia, South Korea, India and China have agreed to work together through the Asia-Pacific Partnership (APP), a new voluntary multilateral agreement to create investment opportunities, build local capacity and remove barriers to the introduction of clean, more efficient energy/development technologies. API is participating in this initiative. In fact, the Asia-Pacific Partnership is the only recent multilateral climate agreement to fully engage India and China – two of the world's fastest growing economies – in a dialogue regarding economic growth, energy use, and GHG emissions management. The objectives of the APP are to assist all partners in meeting national strategies to improve energy security, reduce pollution and address climate change, and enable development and deployment of technologies and practices among partners to promote cleaner, more efficient development and economic growth for all. Given the importance of engaging emerging markets, API urges Congress to appropriate funds to fully fund the APP.

Additional international programs include the Methane to Markets Partnership, which seeks to capture "waste" methane from oil & gas, coal mines, landfills and animal waste management. The captured gas produces additional energy supply and reduces GHGs. EPA estimates up to 50 mmt CO_2e/yr will be captured by 2015. The International Partnership for the Hydrogen Economy (IPHE) coordinates research, development and demonstration of technologies that advance development of a global hydrogen economy. The partnership is working to advance hydrogen and fuel-cell technologies, including codes and standards. The Carbon Sequestration Leadership Forum (CSLF) is designed to aid development of and promote international carbon capture and storage technologies. API and our member companies are contributing participants in nearly all of these programs.

Response to Question 5:
America's oil and natural gas companies are addressing climate change issues as the world's demand for energy increases – driven in large part by economic and social development needs to raise living standards of growing populations around the world. In 2003, API made a voluntary commitment to the Department of Energy to address greenhouse gas emissions. In conjunction with the development of the DOE-ClimateVision program, API established the API Climate Challenge Program which builds on the oil and gas industry's earlier work addressing climate change. Working with government, academic research groups, and others, member companies are undertaking a diverse set of actions addressing greenhouse gas emissions, including:

- Increasing energy efficiency as well as developing and promoting alternative energy use to reduce greenhouse gas emissions;
- Establishing rigorous, industry-wide tools and procedures for estimating and tracking emissions;
- Helping develop new energy technologies as well as carbon capture and storage technology that could reduce or sequester emissions; and
- In partnership with major universities, research institutions, and governments, API members are investing hundreds of millions of dollars to improve and advance the cutting edge technologies and energy sources that are needed for economic progress and energy security, while also addressing the long-term risk of climate change.

As part of API's Climate Challenge Programs, member refiners have committed to improving their energy efficiency by 10 percent between 2002 and 2012 and are on track to meeting this objective. In the second year of this effort (2004), the energy saved was equivalent to taking more than 350,000 cars off the road or the electricity used by over 700,000 homes, with a corresponding impact on greenhouse gas emissions.

In partnership with major universities, research institutions, and governments, API members are investing hundreds of millions of dollars to improve and advance the cutting-edge technologies and energy sources that will help address climate change in both the near-term and long-term.

Additional details about voluntary actions by the oil and gas industry and lessons learned are contained in an addendum to this letter. Regarding overseas operations, given that API is a domestic trade association, information about any actions taken by API members with overseas operations subject to mandatory programs can best be addressed by those members.

ADDENDUM

API Additional Responses to Question 5

Individually, API member companies are voluntarily undertaking a diverse set of actions and have developed numerous tools to mitigate greenhouse gas emissions. These include increased energy efficiency and significant investments in a broad range of advanced energy and technology systems. Additionally, companies are funding research and innovative programs to help improve equipment and operations to cut methane emissions and develop methods to store CO_2 underground.

Accurate estimation of greenhouse gas emissions is indispensable to responsibly addressing climate change. Through API, the U.S. oil and natural gas industry has been at the forefront of developing a suite of tools for consistently and reliably estimating emissions. This includes API's *Compendium* of emissions estimation methodologies and *Guidelines* (created with the international petroleum organization IPIECA) to assist in the accounting and reporting of emissions. In addition, API has made free tracking software available to any oil and gas company to measure emissions. These are available at a special website http://ghg.api.org.

The response to the API Climate Challenge Programs combined with individual companies' initiatives demonstrates the overall commitment by the oil and gas industry to build on earlier industry efforts to address climate change and help achieve to meet the national goal of an 18% greenhouse gas intensity reduction.

Industry Sector and Participants

API represents nearly 400 members companies involved in all aspects of the oil and gas industry as well as other energy technologies. Examples of actions taken by companies under the Climate Challenge Program are drawn from the voluntary actions of the following API members:

ClimateVISION Commitments

In response to the mission of ClimateVISION, API and its members implemented the Climate Challenge Program to contribute to the President's national 18 percent GHG intensity reduction goal. In letters to Secretary of Energy Spencer Abraham, three major programs were established under the overall Climate Challenge umbrella to improve energy efficiency and greenhouse gas emissions intensity while continuing to meet the world's energy needs. These programs were structured to reflect the broad diversity of API members. Major components of the Climate Challenge Program commitments and subsequent actions are addressed below.

Industry Actions Taken to Address Climate Change

- Establish a 10% refinery energy efficiency improvement goal for 2002-2012: Based on the first two years of data, the industry is on track to meet its commitment. During the second year of the program, the energy saved through improved refinery efficiency was equivalent to taking more than 350,000 cars off the road or the electricity used by over 700,000 homes, with a corresponding impact on greenhouse gas emissions.
- Establish a 100% participation goal in EPA's Natural Gas Star Program: By 2006, virtually all the natural gas produced by API members was produced by companies participating in the Natural Gas Star Program. According to EPA, API partners to the Natural Gas STAR program have eliminated nearly 180 billion cubic feet of methane gas emissions.

- Develop the tools necessary for consistent and comprehensive estimation of greenhouse gas emissions from oil and gas operations throughout the world:
    - API, jointly with two other international oil and gas groups (IPIECA and OGP), issued broad *Guidelines* setting a framework for consistent and comprehensive GHG emissions estimation and reporting for the global oil and gas industry.
    - API issued an updated version of its *Compendium* of greenhouse gas estimation methods -- based on lessons learned from its "pilot test version" – that details consistent calculation methods for comprehensive GHG emissions estimation for oil and gas industry operations. This has been a path-breaking effort in the industry's contribution to sound GHG estimation methods.
    - API also established a website (http://ghg.api.org) making the latest versions of these documents available free to the public, along with providing free software (SANGEA™) as one tool oil and gas sector companies can use for GHG emissions estimation and tracking.
    - Establish an annual industry-wide greenhouse gas system for aggregate GHG emissions reporting: API recently began the first U.S. oil and gas industry survey of carbon dioxide and methane emissions with a goal of public reporting of aggregate data after the reliability and consistency of the data is established. This is a voluntary program that will allow individual companies, including API members and non-members, to assess their progress managing GHG emissions and compare improvements in emissions intensity against aggregate industry performance.

Company Projects and Activities

While not exhaustive, following are examples of individual company voluntary actions which illustrate some of the steps being taken by API members under the Climate Challenge Programs. The wide range of actions reflects the diversity of the industry and the numerous strategies being undertaken or developed to address greenhouse gas emissions. Many of these activities are done in partnership with governments and some of the examples are groundbreaking or still in developmental stages.

Emissions and Tracking Activities

- Companies are integrating GHG emissions inventory efforts with the API aggregated GHG emissions reporting program; utilizing innovative technologies to continually improve the energy efficiency of existing operations, new projects and products; and incorporating GHG emission assessments into capital-project evaluations. (BP, Chevron, ExxonMobil, Shell)
- Reducing company GHG emissions by 7 million tons in one year, from 105 million tons of GHGs, which is 15% below 1990 levels. (Shell)
- Participating in the voluntary California Climate Action Registry (CCAR) program for GHG reductions. (BP, Occidental, Shell).

Improving Energy Efficiency

- Implementing a competitive, company-wide five-year program to increase the energy efficiency at a cost of $350 million. In 2005, total primary energy consumption, the amount used to complete operations, was approximately 1.31 billion GJ, 2% less than in 2004. (BP)
- Enhancing a program that tracks and improves refinery energy efficiency. Energy consumption in 2005 was only 76% of that which would have been required to produce the same product slate with 1991 technology. This program has now been extended company-wide. (Chevron)
- Participating in U.S. cogeneration projects that produce enough electricity to power more than one million homes -- electricity that through conventional generation would result in substantial GHG emissions. (Chevron)

- Constructing a 730-megawatt cogeneration plant in North Lincolnshire, England that supplies electricity to two refineries as well as to the nation's electricity grid. (ConocoPhillips)
- Investing in 85 cogeneration facilities at some 30 locations worldwide that, through more efficient production of steam and electric power, enable a reduction in carbon dioxide emissions of nine million metric tons a year. (ExxonMobil)
- Participating in EPA's Combined Heat and Power Partnership, a volunteer program aimed at encouraging increased efficiency and lower greenhouse emissions through cogeneration. (Chevron, ExxonMobil)
- Establishing a company global energy management system, which focuses on opportunities to reduce energy consumed at the company's refineries and chemical complexes, and which saves enough energy to supply over one million European households each year. The greenhouse gas emission effect has been equivalent to taking more than one million cars off the road. (ExxonMobil)
- Joining U.S. EPA's SmartWay Transport program and implementing a variety of measures to increase the fuel efficiency of its transportation fleet, reducing greenhouse gas emissions. (ExxonMobil)
- Gaining membership in EPA's National Environmental Performance Track program – the first refinery in the United States to be so recognized. (Marathon)
- Using cogeneration facilities to reduce greenhouse gas emissions an estimated four million metric tons per year when fully utilized or 20 percent of what the company's combined direct and indirect emissions otherwise would be. (Occidental)
- Developing innovative alternatives to distillation regarding separation of process streams in refining and chemicals operations. These separation technologies consume less energy and result in a decrease of carbon dioxide emissions. (ExxonMobil)
- Having a successful energy efficiency subsidiary (4th largest in the U.S.) working with government, business, and institutional customers which in 2005 alone saved its customers 177 million kilowatt hours of electricity and 1.2 billion cubic feet of natural gas. (Chevron)
- Designating technical experts to focus on reducing energy consumption at company facilities through site specific analysis, resulting in over 1 million tons per year reduction of CO_2 emissions in refineries with an additional 1-2 million tons per year expected over the next several years. These experts are available for use by industry to achieve similar energy efficiency results. (Shell)

Natural Gas/ Flaring/Gasification

- Constructing a Master Gas System in Saudi Arabia's Eastern Province that significantly reduced the company's methane and carbon dioxide emissions from flared natural gas. (Saudi Aramco)
- Implementing the Escravos natural gas plan in Nigeria yields about 300 million cubic feet of gas per day for power generation in the country, thus reducing use of carbon-heavy fuels that produce more greenhouse gas emissions. (Chevron)
- Establishing a new business alliance with a global engineering/construction company for the "licensing, development, engineering, procurement, construction, and operations and maintenance" of a proprietary advanced integrated gasification combined cycle system to promote production of electric power as well as synthesis gas, hydrogen, and steam that is virtually free of pollutant-forming impurities and adaptable for carbon capture and storage projects. (ConocoPhillips)
- Undertaking natural gas flaring reduction projects in Africa facilities, companies have reduced greenhouse gas emissions by about ten million metric tons per year, the equivalent to removing more than one million cars from U.S. roads. (ExxonMobil, Marathon)

- Installing high pressure air systems on all major platforms rather than the more commonly used natural gas activated systems have largely eliminated the methane emissions which are targeted for reduction through the Natural Gas Star Program. (Marathon)
- Investing in increased natural gas production and liquefied natural gas (LNG) facilities has encouraged more use of lower carbon natural gas instead of fuels emitting more CO_2 per Btu of energy. (Chevron, ExxonMobil, Shell)
- Establishing equipment and procedures to minimize or eliminate flaring at both upstream and downstream facilities. (Shell)
- Implementing a Natural Gas Star Best Management Practice in its natural gas well completion operations and reducing methane emissions. (Williams).
- Achieving cumulative methane gas emission reductions of 16 BCF (equal to greenhouse gas reduction of about 6.4 million metric tons of CO_2 equivalent or removing 1.4 million passenger cars) in the U.S. operations through installation of innovative and simple technological and operational methods such as vapor/gas recovery systems whenever technically and economically feasible, thereby capturing natural gas for beneficial uses and reducing greenhouse gas emissions. (Occidental).
- Undertaking a significant pipeline project to recover produced gas for beneficial use and reducing/eliminating flaring in Oman and Qatar. (Occidental).

Carbon Capture and Storage

- Expanding enhanced oil recovery efforts in Wyoming and extending the lives of some aging oil fields by injecting into the oil reservoirs CO_2 that otherwise would have been vented into the atmosphere. More than 30 million tons of CO_2 are expected to be sequestered over the lifetime of the Salt Creek and Monnell projects alone. This geological sequestration effort is one of the largest projects of its kind in the world. (Anadarko)
- Undertaking carbon capture and storage in the In Salah gas field in the Algeria desert, where approximately 10 percent of the gas in the reservoir consists of CO_2, results in about one million tons of CO_2 being injected every year, reducing greenhouse gas emissions by the equivalent of taking 200,000 cars off the roads. Rather than venting it to the atmosphere, the CO_2 is compressed and injected in wells 1,800 meters deep. (BP)
- Injecting millions of tons of CO_2 into oil reservoirs for enhanced oil recovery and extending the lives of aging fields in the Permian Basin and California region. (Occidental).
- Participating in the $50 million international CO_2 Capture Project promotes development of new technologies to reduce the cost of capturing CO_2 from combustion sources and safely storing it underground. These new technologies will eventually apply to a large number of CO_2 sources globally, such as power plants and other industrial processes. (BP, Chevron, ConocoPhillips, Shell)
- Researching new technologies has resulted in a new patented coal gasification technology being used in Australia for the world's first coal-fired power plant with CO_2 capture and storage. (Shell)
- Planning for a major new CO_2 storage project off the coast of Norway was announced in early 2006. (Shell)
- Capturing CO_2 from refineries and chemical plants in the Netherlands, and piping them to greenhouses for enhanced growing of crops, and eliminating the need for combustion of natural gas at the greenhouses. (Shell)
- Working with the European Commission Directorate General for Research and the International Energy Agency on the CO2ReMove project, companies are evaluating a range of technologies for monitoring the injection and underground storage of CO_2 at projects in Norway, Algeria, and Germany. (BP, ConocoPhillips, ExxonMobil)
- Supporting academic research at a number of institutions (MIT, Stanford, University of Texas, International Energy Agency Greenhouse Gas R&D Programme, Batelle Pacific Northwest

National Laboratories) on capture technologies, assessment of storage sites, strategies for disposal, fate and effects of stored CO_2 and economic evaluation of carbon capture and storage. (ExxonMobil)

Advancing Energy Technologies

- Operating a jointly owned wind farm near Rotterdam in the Netherlands with a generating capacity of 22.5 megawatts of electricity – equal to the amount used by 20,000 households – displaces 20,000 tons of CO_2 per year at full capacity. (BP, Chevron)
- Operating wind farms in Europe and the U.S. with the second largest output of wind energy globally. (Shell)
- Participating in basic fuel cell system R&D as well as in DOE's National Fleet and Infrastructure Demonstration and Validation Program to test fuel cell cars and buses, and building hydrogen refueling stations in preparation for possible commercialization of fuel cell vehicles. (BP, Chevron, Shell, ConocoPhillips)
- Expanding U.S.-based solar energy production capacity to meet growing demand and to create jobs. When complete, the BP facility will be the largest fully integrated solar manufacturing plant in North America. (BP)
- Investing in four major geothermal energy projects that produce clean electricity for Indonesia and the Philippines results in avoided greenhouse gas emissions of over 6 million tons annually if compared to a typical power grid generation. Overall, this contributes to the output of the world's largest producer of geothermal energy. (Chevron)
- Participating in a multi-company project designed to convert natural gas into hydrogen and carbon dioxide, then using the hydrogen gas as fuel for a 350MW power station and exporting the carbon dioxide to a North Sea oil reservoir for increased oil recovery and ultimate storage. (BP, ConocoPhillips, Shell)
- Marketing hydrogen at fueling stations on the East and West coast for properly equipped motor vehicle fleets. (Shell)
- Undertaking an investment of over $1 billion dollars in Southern California to construct the first-of-its-kind low-carbon power plant. Through gasification, petroleum coke is converted to hydrogen gas and CO_2. The hydrogen is used to drive a gas turbine to generate electricity. The captured CO_2 will be shipped by pipeline to California oilfields and injected into reservoir rock formations deep below the surface, both stimulating oil production and permanently storing the CO_2. (BP)
- Working with the state of California, GM, and others to evaluate a reformulated blend of E85 (85 percent ethanol/15 percent gasoline) as well as providing renewable fuel for the demonstration sites for a fleet of 50 state vehicles. (Chevron)
- Test-marketing E85 (85 percent Ethanol/15 percent gasoline) in the Chicago area as motor fuel. (Shell)
- Projecting expenditures of $2 billion between 2006 and 2008 on alternative energy, renewable energy, and energy efficiency services, including projects in wind, solar energy, and biofuels. (Chevron)
- Developing a novel technique for hydrogen production, which may be compatible with both on-board vehicle and larger-scale applications. (ExxonMobil)
- Working with the auto industry and heavy equipment manufacturers on separate programs to design high-efficiency, low-emission gasoline and diesel fuel/engine systems. High-efficiency engines mean reduced greenhouse gas emissions. (ExxonMobil)
- Partnering with Dupont to develop and bring to market advanced biofuels with properties that overcome the limitations of existing biofuels – expanding options for energy supplies and accelerating the move to renewable transportation fuels. (BP)

- Aim to invest $8 billion over 10 years in a new alternative energy business including solar, wind, hydrogen, and gas sources. (BP)

Research and Development / Partnering

- Partnering with Ford Motor Company to establish the Carbon Mitigation Initiative at Princeton University -- an initiative designed to develop strategies to reduce global carbon dioxide emissions that will be safe, effective, and affordable.(BP)
- Partnering individually with the Georgia Institute of Technology, U.C.-Davis, and the DOE's National Renewable Energy Laboratory to pursue advanced technology aimed at making cellulosic biofuels and hydrogen viable transportation fuels. (Chevron)
- Announcing a $500 million investment to establish an Energy Biosciences Institute at a major University – aimed at probing the emerging secrets of bioscience and applying them to the production of new and cleaner energy, principally fuels for road transport.(BP)
- Partnering with other companies to support the Stanford University Global Climate and Energy Project -- the largest-ever independent climate and energy research effort. At the end of 2005, 27 projects were underway related to hydrogen power, advanced combustion, solar energy, CO_2 storage, CO_2 capture and separation, biomass, and advanced materials and catalysts. (ExxonMobil)
- Launching an $8 million project at Imperial College London to research the use of energy in cities. The Urban Energy Systems project will explore in detail how energy, people and materials flow through a city and how money and energy could be saved in the future. (BP)
- Partnering with the U.S.EPA in evaluating three major voluntary projects designed to eliminate gas flaring and reducing methane emissions in Colombia. (Occidental).
- Supporting a 10 year $10 million program called "Clean Energy – Facing the Future" at the Chinese Academy of Science and Tsinghua University, Beijing. The program is looking at potential breakthroughs in clean energy technologies to enable China and the rest of the world to meet future demand for energy without damaging the environment. Also, a $500,000 grant will help establish the Tsinghua BP Clean Energy Research and Education Centre. (BP)
- Investing in one of the nation's first large scale biodiesel facilities which has the potential to significantly increase the amount of biodiesel produced in the U.S. (Chevron)

Related Industry Programs

- Working with the National Petrochemical and Refining Association (NPRA), API is tracking improvements in the nation's overall refinery energy efficiency.
- Working with EPA's Natural Gas STAR program, API and its members are working voluntarily to reduce methane emissions in the oil and gas industry. The U.S. EPA's Natural Gas STAR program plays an important role in API's mission to work constructively for sound energy and environmental public policies. (Anadarko, BP, Chevron, ConocoPhillips, ExxonMobil, Marathon, Murphy Oil, Occidental, Shell, Williams)
- Signing on as Charter Members of EPA's new Natural Gas Star International program, which promotes the international adoption of the successes of the domestic program as part of the broader international Methane to Markets initiative. (ConocoPhillips, Devon, Enbridge, ExxonMobil, Marathon, Occidental)
- Partnering with the World Bank's Global Gas Flaring Reduction (GGFR) program, API and members are working to overcome barriers to reducing associated natural gas flaring. (BP, Chevron, ExxonMobil, Marathon, Shell)

Recent Industry Highlights and Overall Commitment

The oil and gas industry is actively addressing the reduction of greenhouse gas emissions. API members established industry and individual company goals and are now meeting them through company action to address climate change emissions. These actions range from developing internal programs to improve energy efficiency, addressing greenhouse gas emissions through near-term and long-term focused actions, and tracking progress using consistent and comprehensive greenhouse gas emissions estimation tools and measures of greenhouse gas intensity of operations.

As discussed above, the significant actions companies are taking to achieve their goals include:

- Using combined heat and power technology as well as broad company-wide programs to enhance energy efficiency;
- Developing and marketing alternative energy and new advanced energy technology;
- Storing carbon dioxide emissions underground;
- Reducing natural gas flaring;
- Developing and employing new emissions estimating and tracking tools to help assess how well they are meeting their emission management targets.