U.S. Department of Energy Assessment of the National Petroleum Council's Report, *Facing the Hard Truths about Energy: A Comprehensive View to 2030 of Global Oil and Natural Gas*

The National Petroleum Council (NPC) recommendations contained in the ***Hard Truths*** report provide a benchmark against which to measure recent and future U.S. energy policy developments. The NPC's recommendations also make clear the need to develop a national consensus on energy priorities such as the development of domestic energy resources.

This brief assessment provides the Department of Energy's initial response to the report's recommendations. Many current Administration energy policies and supporting initiatives are consistent with the ***Hard Truths*** report recommendations. The Department of Energy (DOE) recognizes, however, that further action by industry, government, and consumers will be needed to ensure sufficient energy supplies to meet future demand in the United States and globally.

1. NPC Energy Demand Recommendation: *The United States must moderate the growing demand for energy by increasing efficiency of transportation, residential, commercial, and industrial uses.*

From the 2001 release of the Administration's National Energy Policy to the 2006 and 2007 State of the Unions addresses, the President has continually advocated increasing efficiency. Working with Congress on this goal, the President signed the Energy Policy Act of 2005 (EPAct 2005) and the Energy Independence and Security Act of 2007 (EISA 2007).

- **Transportation Efficiency:** In his 2006 State of the Union address, the President announced his ***Advanced Energy Initiative*** to provide greater research and development investment in new motor vehicle and fuel technologies to reduce our dependence on petroleum, such as advanced batteries for plug-in hybrid vehicles, advanced biofuels and hydrogen vehicles. In 2007, the President introduced the ***Twenty in Ten*** initiative, calling for both improvements in vehicle efficiency and increased fuel diversity. On December 19, 2007, the President signed EISA 2007, which includes vehicle efficiency provisions that will increase fuel economy standards by 40 percent and save billions of gallons of fuel.

- **Appliance Efficiency:** DOE is updating Federal efficiency standards on a regular basis as well as establishing appliance standards for new products for residential buildings. DOE is improving and expanding the appliance efficiency program consistent with energy legislation signed in 2005 and 2007. The EISA 2007**,** for example, included provisions that will:
    - Require all general purpose lighting in Federal buildings to use ENERGY STAR® products or products designated under the Energy Department's Federal Energy Management Program by the end of Fiscal Year 2013;
    - Update the Energy Policy and Conservation Act to prescribe or revise standards affecting regional efficiency for heating and cooling products, procedures for new or amended standards, energy conservation, energy efficiency labeling for consumer

electronic products, residential boiler efficiency, electric motor efficiency, and home appliances; and
- Establish an Office of High-Performance Green Buildings in the U.S. General Services Administration.

Furthermore, DOE is modernizing the ENERGY STAR program to accommodate the increasingly rapid flow and evolution of high efficiency technologies such as solid state lighting, tankless water heaters, and solar products.

- **Building Efficiency:** DOE is working with States to formulate model codes for new residential and commercial buildings that would reduce energy use by 30 percent from current model code levels, without increasing building life cycle costs. Recent energy legislation signed by the President will build on this effort by also including requirements for significantly refurbished buildings

- **Industrial Efficiency:** DOE conducts research and development of industrial energy efficiency technologies through the Department's Industrial Technologies Program (ITP). Best Practices developed by ITP have become a key component of ***Save Energy Now,*** a national campaign launched by Secretary Bodman in 2005 in response to high industrial energy prices. Under this program, DOE provides technical assistance, software tools, training, and other support to help industrial manufacturers increase the energy efficiency of their operations. Many State industrial efficiency efforts are also incorporating ITP Best Practices resources into their programs.

2. NPC Energy Supply Recommendation: ***Expand and diversify production from clean coal, nuclear, biomass, other renewables, and unconventional oil and gas; moderate the decline of conventional domestic oil and gas production; and increase access for development of new resources.***

While fossil fuels will remain a significant part of the U.S. energy supply, new energy options must also be aggressively pursued. These alternatives include not only solar and wind power, which DOE is aggressively pursuing, but also the increased use of nuclear power, environmentally-responsible electricity generation through coal-fired plants that utilize carbon-capture and sequestration technology, and a greater reliance on bio-science and bio-fuels to produce fuels for use in the transportation sector. DOE is working to bolster both traditional and alternative sources of energy.

- **Coal:** The President's ***Clean Coal Power Initiative*** aims to reduce emissions and improve the efficiency of existing and new coal-based power plants through private-public cost-sharing partnerships. Also, DOE is working with the Internal Revenue Service to award $1.6 billion in tax credits provided by EPAct 2005 for the deployment of advanced coal and gasification projects in commercial use.

- **Nuclear:** Nuclear power is a source of clean and reliable base load energy. DOE's three key elements of nuclear power policy agenda include:
    - Create an environment where new nuclear power plants will be built here in the U.S. as soon as possible.

- License Yucca Mountain and move spent fuel.
- Develop the advanced recycling technologies that will be necessary to a growing nuclear sector, and promote standards for a safe, peaceful, and secure fuel cycle through the ***Global Nuclear Energy Partnership***.

DOE also supports nuclear power expansion through the ***Nuclear Power 2010*** program, which is focused on Early Site Permitting and standardized plant designs that can be approved by the Nuclear Regulatory Commission (NRC) as part of a combined construction and operating license. As of December 1, 2007, three applications for new nuclear power plant licenses were filed with the NRC; as many as twenty applications are anticipated to be filed over the next two years. The catalyst for much of the recent nuclear activity is due largely to several provisions of EPAct 2005 designed to support the expansion of nuclear power. These key EPAct 2005 nuclear provisions provided:

- Extension of the Price Anderson indemnity program through 2025;
- Federal risk insurance to the first six new nuclear plants to protect builders of these plants against lawsuits, bureaucratic obstacles, and other delays beyond their control;
- Production tax credits to reward investments in the latest in advanced nuclear power generation; and
- Availability of loan guarantees to help will give investors confidence that the Federal Government is committed to the construction of nuclear power plants.

- **Biofuels:** As part of the ***Twenty in Ten*** initiative, the President called for a bold advanced fuel mandate to help reduce gasoline consumption. The EISA 2007 expanded the EPAct 2005 renewable fuel standard to a target of 36 billion gallons by 2022.

- **Unconventional Oil and Gas Resources:** America's oil shale resources exceed 2 trillion barrels. Of that, as much as 800 billion barrels of oil equivalent could be recoverable. Domestic tar sands resources are estimated to be 54 billion barrels. Estimates of U.S. heavy oil resources in place range from 60 to 100 billion barrels, of which 2 billon barrels are proved reserves and another 20 billion barrels could be ultimately recoverable. DOE continues to support efforts to overcome the technical, economic and legal challenges in recovering these resources. Under EPAct 2005, DOE is implementing a program of research, development and commercial application of advanced technologies for ultra-deepwater and unconventional oil and natural gas exploration and production to boost supplies of oil and natural gas to U.S. consumers.

- **Oil and Gas Production:** DOE is developing methods to revitalize production from both marginal wells and more mature oil and gas fields. DOE has funded first-of-a-kind enhanced oil recovery (EOR) projects to inject CO_2 produced by ethanol processing into existing reservoirs. DOE studies indicate that more widespread utilization of EOR technologies utilizing CO_2 could reduce greenhouse gas emissions, and add 89 to 430 billion barrels to U.S. recoverable oil resources.

- **Oil and Gas Regulations:** Cumbersome regulations have been streamlined so that it is less costly and time consuming for the private sector to produce our nation's oil and gas. DOE will continue to coordinate with other agencies to ensure that Federal regulatory actions do not unnecessarily constrain the development of U.S. oil and gas resources.

- **Developing Oil and Gas Resources:** Developing reliable domestic resources found in the Outer Continental Shelf (OCS) in an environmentally sound manner will increase American energy security. EPAct 2005 provided for a survey of oil and gas resources in the OCS, which was completed in 2006 and updates every five years. In 2006, the President signed the Gulf of Mexico Energy Security Act to increase access to domestic oil and natural gas resources in the OCS. The Administration has called on Congress to authorize the environmentally-safe development of a small portion of the Arctic National Wildlife Refuge which may contain more than 15 billion barrels of recoverable oil.

3**. NPC International Relations Recommendation:** ***The United States must integrate energy policy into trade, economic, environmental, security, and foreign policies; strengthen global energy trade and investment; and broaden dialogue with both producing and consuming nations to improve global energy security.***

DOE is committed to international energy collaboration and dialogue with consuming and producing countries as necessary and appropriate. DOE believes the best way to secure global energy markets is through the efficient, economic development of these resources based on market principles and competition.

- **Collaboration:** The Administration is actively pursuing a number of international collaborations to promote energy efficiency, encourage early commercialization of clean energy technologies, expand safe international nuclear power, and diversify supplies of oil and natural gas. Some examples of these efforts are described below.
    - Through the ***Asia – Pacific Partnership on Clean Development and Climate***, the Administration is working with countries in the Pacific to develop and accelerate the deployment of cleaner and more efficient technologies and practices.
    - The ***Global Nuclear Energy Partnership*** is a voluntary international partnership to implement a global fuel leasing and assurances regime.
    - The ***Methane to Markets*** partnership focuses on ways to advance cost-effective, near-term methane recovery and use as a clean energy source.

- **Dialouge:** The Administration works with governments around the world to strengthen geopolitical energy security. This effort includes the following:
    - Engaging non-IEA (International Energy Agency) governments such as China and India to develop and hold strategic oil stocks;
    - Encouraging IEA membership and collaboration to reduce pressure on international oil and gas supplies;
    - Maintaining an active diplomatic effort to promote oil and natural gas production and infrastructure development that diversifies export routes from interior basins around the world;
    - Promoting transparent and competitive international energy markets that eliminate anti-market practices in oil and natural gas; and
    - Advocating energy market policies in response to growing energy nationalism, bilateralism between foreign governments and state entities in oil and gas investments, and reduced flexibility in international energy markets.

4. NPC Science and Technology Capabilities Recommendation: ***Enhance science and engineering capabilities and create long-term opportunities for research and development in all phases of the energy supply and demand system.***

As a leader in energy research and development, DOE recognizes the importance of expanding science and engineering capabilities to meet the country's future needs. DOE is currently taking steps to meet the technological challenges the NPC sets forth in its report.

- **U.S. Science and Engineering Capabilities**: DOE shares the NPC's concern about whether this nation will continue to have the scientists and engineers needed to carry this work on energy technologies forward into the future. DOE's Workforce Development for Teachers and Scientists program continues the DOE's long-standing role of training young scientists, engineers and technicians in the scientifically and technically advanced environment of our National Laboratories.

- **Research and Development Opportunities:** With a nearly $4 billion annual budget, DOE's Office of Science has played a central role over the last 50 years in supporting and sustaining institutional research in the physical sciences in the United States. Building on this tradition, the President's ***American Competitiveness Initiative***, launched in his State of the Union address in 2006 will encourage American innovation and strengthen our Nation's ability to compete in the global economy. The President's comprehensive strategy to strengthen America's competitiveness includes:
    - Doubling the Federal commitment to the most critical basic research programs in the physical sciences over the next 10 years;
    - Supporting universities that provide world-class education and research opportunities; and
    - Fostering a business environment that encourages entrepreneurship and protects intellectual property.

- **Energy Data Quality:** DOE maintains some of the highest quality energy data in the world. Nevertheless DOE shares NPC's belief that energy data quality can be improved. DOE believes this effort should be expanded internationally to encourage governments to systematically develop, share and publish data on all phases of energy production and use. DOE will continue to support efforts by the Energy Information Administration, International Energy Agency, and by other governments to improve the data on current and future energy supply and demand.

5. NPC Carbon Management Recommendation: ***The United States must develop the legal and regulatory framework to enable carbon capture and sequestration (CCS). In addition, as policymakers consider options to reduce CO_2 emissions, provide an effective, global framework for carbon management, including establishment of a transparent, predictable, economy-wide cost for CO_2 emissions.***

DOE agrees with the NPC that coal will remain indispensable to meeting total projected energy demand. Coal has a vital role in the President's vision for greater energy security. Continued reliance on coal as a major energy source requires effort to reduce coal's environmental impact.

DOE also recognizes the growing value of unconventional oil (*e.g.*, heavy oil, shale oil, coal-to liquids), which would require the application of CCS in a carbon-constrained world. DOE is committed to the research, development, and implementation of advanced technologies that can address CO_2 management.

- **CCS Legal and Regulatory Framework:** DOE has worked closely with the Environmental Protection Agency (EPA), the States, and organizations such as the Interstate Oil and Gas Compact Commission to establish a standardized regulatory framework for CO_2 storage in deep geologic formations. In December 2007, DOE participated in EPA's first workshop in preparation for a proposed rule for large-scale injection of CO_2.

- **CCS Technologies:** DOE is working to increase the cost-effectiveness of carbon capture technologies and to prove the viability of long-term geologic and terrestrial storage of that CO_2. DOE's ***Regional Carbon Sequestration Partnership*** is co-funding field tests for large-scale CCS demonstrations. As the NPC noted, such large-scale tests are needed to prove that sequestration technologies can be commercialized and effectively mitigate greenhouse gas emissions.

- **National CCS Capacity Assessment:** Researchers at the DOE's National Energy Technology Laboratory recently introduced technology that searches vast areas with abandoned oil and gas reservoirs for potential sites to permanently store CO_2. This award-winning breakthrough is the first commercially available technology to perform such searches.

- **CO_2 Emissions Policy:** The President's ***Major Economies Initiative*** is an effort to work with the world's largest energy users and greenhouse gas producers to establish a new international approach on energy security and climate change in 2008 that will contribute to a global agreement by 2009 under the United Nations Framework Convention on Climate Change.

Conclusion

The NPC's report represents a comprehensive, thoughtful approach to energy policy. The report aids the Administration's work to assess steps already taken as well as identify future measures to ensure energy security. DOE shares many of the NPC's views and welcomes the NPC's suggestions for improvements. Throughout his Administration, the President has worked with Congress to meet many of the challenges set forth in the NPC's report. DOE looks forward to continuing this effort to move the country toward a more diversified and reliable energy portfolio.