

**U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE AND TECHNOLOGY
SUBCOMMITTEE ON ENERGY AND ENVIRONMENT**

HEARING CHARTER

**Energizing Houston:
Sustainability, Technological Innovation, and Growth
In the Energy Capital of the World**

Friday, February 29, 2008

10:30 a.m. – 12:30 p.m.

James A. Baker III Institute, Rice University, Houston, Texas

Purpose

On Friday, February 29, 2008 the House Committee on Science and Technology, Subcommittee on Energy and Environment will hold a hearing entitled, “*Energizing Houston: Sustainability, Technological Innovation, and Growth in the Energy Capital of the World*,” at the James A. Baker III Institute for Public Policy, Rice University, Houston Texas.

The Subcommittee’s hearing will explore how the energy industry and cities like Houston are working to address challenges in areas such as energy supply and security, global climate change, and rapid economic growth.

Witnesses

Panel I:

Mr. Bill White, *Mayor of the City of Houston*, will discuss City of Houston initiatives to encourage energy conservation and clean energy technologies, while preserving the Houston region’s competitiveness in an increasingly global marketplace.

Mr. John Hofmeister, *President of the Shell Oil Company*, will discuss energy challenges facing the nation, and the major technical barriers to deploying a range of energy options including conventional and unconventional oil and gas and alternative energy resources.

Mr. Thomas Standish, *President of Regulated Operations, CenterPoint Energy*, will discuss the importance of federal funding of research and development to realize the potential of SmartGrid technologies, and other energy efficiency and emissions reductions efforts CenterPoint has underway in Houston.

Panel II:

Dr. Walter Chapman, *Director of the Energy and Environment Systems Institute, Rice University*, will describe how university-based research can provide new opportunities in conventional and unconventional oil and gas exploration, as well as renewable energy technologies. Professor Chapman will also address the funding challenges for energy research and need for education and outreach programs in energy fields.

Dr. Robert Harriss, *President & CEO, Houston Advanced Research Center*, will discuss research and technology development efforts in the Houston area to mitigate global climate change impacts of the region; to reduce energy consumption of homes; businesses and heavy industry; and encourage sustainable development.

Dr. Robert Hirsch, *Senior Energy Advisor, Management Information Services Inc.*, will discuss the economic implications of oil shortage scenarios, how government and the energy industry should address a crisis of peak oil, and the potential impact of various energy technologies.

Mr. Michael Ming, *President, Research Partnership to Secure Energy for America (RPSEA)*, will discuss the potential of public-private research and development efforts to access previously unrecoverable reserves of energy in ultra-deepwater offshore and unconventional onshore oil and gas reservoirs.

Background

As the sixth largest metropolitan area in the U.S. with a population of 5.5 million, the greater Houston region continues to undergo rapid economic expansion and population growth. In every decade since 1850, the City of Houston's population has grown by at least 29 percent. This growth is due largely to Houston's proximity to raw materials, sea ports, and related infrastructure. Houston is a major port for agricultural exports and a center for oil and natural gas research, exploration, and production. However, with this rapid development come immense challenges to consumers, city planners, local energy providers, and local industries that must stay competitive in an increasingly global marketplace. Witnesses on the first panel will discuss how local initiatives in cities such as Houston can address these issues.

The challenge for all stakeholders lies in the need for the U.S. to obtain more energy from a variety of domestic sources, enhance the energy efficiency of communities and industry, become less reliant on energy sources and technologies that have an adverse effect on the environment, and to integrate these often-competing factors into policies and practices that lead to a more sustainable economy. The push for new technologies is especially urgent given the geopolitical and market forces that threaten global energy supplies and economic stability, finite fossil fuel reserves, the direct and indirect costs of energy to consumers, the looming threat of global climate change, and probable regulation of carbon dioxide emissions.

Given the magnitude and complexity of global energy use, research and development must begin to address these competing needs soon for technologies to penetrate the market and have an impact on our long-term energy and environmental goals. Complex challenges also call for a refined approach to energy R&D, one that incorporates the expertise and resources of the nation's universities, government research labs, and private industry into cohesive efforts to overcome major technical barriers. Witnesses on the second panel will address how new models for technological innovation, including public-private research partnerships, and university-based basic research can be integrated overcome grand technical challenges in sustainable development.

Houston and Energy Technology

Houston has grown to support a number of diverse industries in sectors such as aerospace and chemicals production, yet energy remains the largest sector accounting for an estimated 48 percent of the region's employment. According to estimates by the Greater Houston Partnership, Houston's energy industry includes the headquarters for 17 Fortune 500 energy companies, more than 3,600 energy related establishments, 13 of the nation's 20 largest natural gas transmission companies, 600 exploration and production firms, more than 170 pipeline operators and hundreds of energy-sector product manufacturers. This concentration of energy companies and expertise in the area has allowed the region to be a leader in international energy technology markets, beyond its role as a producer of oil and gas from the Gulf of Mexico. Houston has evolved into a global oil-technology development and distribution center, providing advanced oil and gas technologies for development of oil fields in the Middle East, the North Sea, Malaysia, Indonesia, South America and West Africa.

While it will continue to be a center for the petroleum industry in the U.S. Houston, along with the rest of the state of Texas, is rapidly becoming a focal point for renewable energy and energy efficiency technology development. Wind energy is one of the most promising and commercially viable renewable resources. The wind industry in Texas grew substantially after a 1999 state law that required a base percentage of electricity sold by utilities in the state to be generated from renewable sources. Since then, Texas has surpassed the rest of the country in installing wind capacity, allowing cities like Dallas (40 percent) and Houston (20 percent) to acquire a significant portion of their purchased electricity from renewable sources. The utilization of renewables and end-use energy efficiency measures will be further optimized by the deployment of "Smart Grid" technologies that integrate new communications and control functions into the electricity distribution grid. Located at the center of a nationwide fuel distribution and agricultural transportation network, Houston is also quickly becoming a hub for the biofuels industry with several of the country's major biofuels firms located in the region.

The City of Houston has also encouraged the use of renewable energy technologies and energy efficiency at the local level. The City has integrated renewable

energy technologies into local infrastructure. For example, school crosswalks use solar energy and in 2005, Mayor Bill White announced plans to convert a substantial portion of the City's fleet of cars, pickup trucks and sport utility vehicles to hybrids by the year 2010. Houston also hosted the first conference on Carbon Emissions Trading with the British Consulate-General and the Greater Houston Partnership in January 2007.

Ultra Deepwater Research and Development

The hearing will also examine efforts underway to increase our domestic production of natural gas and other petroleum resources in ultra-deep offshore waters and in unconventional onshore formations. As offshore production declines in the shallow waters of the Gulf of Mexico, industry is looking to produce from oil and gas resources in deep-water (depths of 200-1,500 meters) and ultra-deepwater (depths greater than 1,500 meters). According to the Minerals Management Service, untapped fields on the outer continental shelf could account for 86 billion barrels of oil and 420 trillion cubic feet of gas.

Establishing wells at these depths, however, presents significant technological challenges. Simply characterizing these reservoirs requires improved exploration and depth imaging technologies. Drilling under these extreme conditions will be a more daunting challenge. As it will require extensive seafloor infrastructure, more research is needed in new production materials and architectures, and the integration of multiple systems including power distribution and data communication.

In May 2006, the Research Partnership to Secure Energy for America (RPSEA) located in Sugar Land was selected to administer R&D contracts for the Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Resources Program established in Section 999 of the Energy Policy Act of 2005. The law mandated new oil and gas research and development program with funding totaling near \$500 million for ten years derived from royalties, rents, and bonuses from federal onshore and offshore oil and gas leases.