National and State Energy Policy Trends

Appalachian Region Energy Blueprint Research Brief
Prepared by: The Keystone Center

Introduction

The following is a compilation of recent national and state energy policies and programs that are an important backdrop to the development of the Appalachian Region Energy Blueprint.[1] The national energy policy overview provides a better understanding of the energy technologies and supply alternatives that are being promoted through federal incentives and research, and presents the array of federal energy demand-side policies and programs, such as promotion of increased end use efficiency. The state energy policy overview focuses first on what is happening in the 13 Appalachian states and then provides examples of other state and regional policies and initiatives that are setting trends across the country. We have provided suggestions for how the Appalachian Regional Commission and states might build on these efforts to develop a more cohesive regional energy blueprint.

National Energy Policy and Program Trends

Over the past five years, the primary objectives for national energy policy have been ensuring energy reliability and affordability and advancing energy independence and security. There are a number of tools that both state and federal government rely on to meet energy policy objectives, and each approach has its own advantages. Below are the categories of approaches described throughout this report.

- *Technology Research and Development and Demonstration programs* (e.g., integrated gasification and combined cycle coal and carbon capture and sequestration) are typically directed to emerging technologies to help advance the effectiveness and demonstrate the reliability of the technology.
- *Investment Incentives* (e.g., coal liquefaction and alternative fuel stations) are more likely to be used where the technology is proven but there investment is lagging because of the technology is only marginally economic or there is uncertainty about consumer demand.
- *Production Incentives* (e.g., renewable energy production credits and manufacture tax credits) can be effective tools to spur production of energy sources or efficient products, particularly where there is underutilized production capacity or existing capacity can be redeployed to make new products.
- *Consumer Adoption Incentives* (e.g., Energy Star labeling and tax incentives) include providing information to advance preferable products to consumer rebates and tax incentives that reduce the cost of technologies and products that are more expensive to purchase but provide life cycle benefits.
- *Standards and Mandates* (e.g., renewable fuel standards and building codes) are exercised when there is a compelling public policy reason and market-based approaches are not effective.

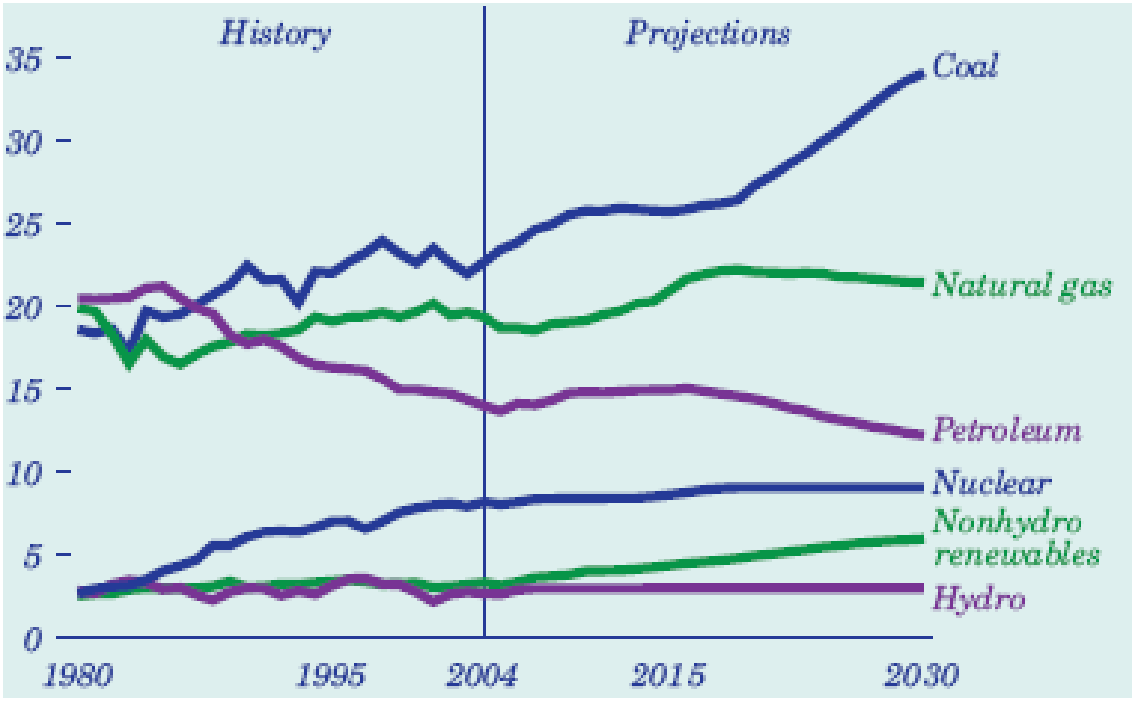
[1] This is not intended to be a comprehensive review of national energy policy, rather a summary of those policies and programs that are most relevant to the Appalachian region.

- *Reducing regulatory burdens* (e.g., nuclear licensing changes) is a low cost but effective approach which may be helpful when there are multiple jurisdictions or agencies that have responsibility for approving implementation of an energy technology.

I. Supply Side Energy Policies and Programs

To meet national energy policy objectives of energy independence, affordability and reliability, supply-side policies are designed to increase availability and diversity of fuel sources, advance technologies that use fuels more efficiently, and address fuel constraints through development of alternative energy sources. Below is the U.S. DOE, Energy Information Administration's (EIA) 2006 Annual Energy Outlook reference case forecast of U.S. energy production through 2030.

Figure 7. Energy production by fuel, 1980-2030 (quadrillion Btu)



Of increasing concern are predictions of the depletion of global oil supplies (peaking oil), the national security implications of importing fuels from unstable regions of the world, and the climate change impacts of fossil fuel energy sources. EIA predicts that national energy consumption will continue to outstrip domestic energy production over this period, increasing the U.S. dependence on imported energy. This increasing gap between forecasted demand and domestic supply, combined with the predictions that we are nearing peak oil production and entering a downward production slope, presents an unprecedented challenge for the U.S. According to several experts, the U.S. is likely to face steeply increasing prices and price

volatility with substantial economic and social ramifications unless mitigation efforts begin at least a decade before peak oil years.[2]

Therefore, many of the policies and programs described below are designed to take greater advantage of domestic energy sources such as coal and renewable energy or to find alternative energy sources such as biofuels to displace imports of oil. This strategy of import substitution can not only increase energy security and price stability, but can lead to the generation of new energy-based industries and jobs. As will be discussed later, demand-side energy policies and programs also contributed to import substitution, the generation of new energy services and industries, and economic development opportunities.

A. Coal

1. Clean Coal Research, Development, and Demonstration (RD&D)

Support for clean coal technologies RD&D has increased substantially under the Bush administration. Building on the commitment to invest $2 billion in clean coal technologies by 2012, the President's 2007 budget includes $281 million in funding for the **Coal Research Initiative.** This program includes $54 million for the **FutureGen Initiative**,[3] a public-private sector partnership formed to develop innovative, low-emission technologies to produce hydrogen and electricity from coal and capture the carbon emissions for geologic storage. The proposed Integrated Gasification Combined Cycle Technology (IGCC) will be built and partially-funded by FutureGen Industrial Alliance, an international non-profit consortium of major coal and electricity companies.[4] Seven states (Illinois, Kentucky, North Dakota, Ohio, Texas, West Virginia, and Wyoming) are competing for the site of the plant which is expected to take ten years to complete. The goal of the project is to establish the effectiveness and reliability of the technology and help lower costs to make IGCC competitive, particularly with Eastern high rank coal. [5] DOE recently announced that four sites in Texas and Illinois were named today as finalists for the FutureGen project.[6]

Additional federally-funded research is focused on ultra supercritical pulverized coal (UCSPC) plants, which hold the potential of increased efficiency and lower emissions than conventional pulverized coal plants, and are more suitable for low rank coals such as Powder River Basin.[7] Although estimated to be less expensive than IGCC,

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[2] Robert Hirsch, Roger Bezdek and Robert Wendling, Peaking of World Oil Production: Impacts, Mitigation , and Risk Management., Feb. 2005.
Also NRC, Workshop on Trends in Oil Supply and Demand, Potential for Peaking in Conventional Oil Production, and Possible Mitigation Options, 2006.

[3] http://www.fossil.energy.gov/programs/powersystems/futuregen/

[4] Alliance members include a number of companies with interests in the Appalachian region: American Electric Power, Southern Company, Peabody, Foundation and Kennecott Coal companies, CONSOL Energy and PPL Corporation. (http://www.futuregenalliance.org/alliance.stm)

[5] In 2004, American Electric Power announced it planned to move ahead in the construction of an IGCC plant. AEP hopes to complete the demonstration plant by 2010 and is currently reviewing potential sites in OH, KY and WVA.

[6] Greenwire, July 25, 2006

[7] For more information on IGCC and PC technology and costs, see EPRI's 6/19/06 presentation to EPA State Clean Energy-Environment Technical Forum. www.keystone.org/

UCSPC plants cannot capture carbon emissions cost-effectively in comparison to IGCC and cannot be retrofitted for carbon capture..

Energy Policy Act of 2005 (EPACT) includes new tax investment incentives for clean coal facilities and allows a seven-year accelerated recovery period on pollution controls on coal-fired electric power plants.

2. Carbon Capture and Geologic Sequestration (CCS) RD&D

CCS technology is the key to making IGCC competitive under a carbon management system. However, with current technology capturing the CO2 emissions during the gasification process is energy intensive and expensive, adding as much as 40% to the capital costs and a 20% energy penalty. To advance the technology, DOE is sponsoring seven public-private RD&D partnerships. The program is designed to demonstrate a portfolio of safe, cost-effective greenhouse gas capture, storage, and mitigation technologies at the commercial scale by 2012.[8]

One of the partnerships, **the Southeast Regional Carbon Sequestration Partnership (SECARB),** includes a number of number of Appalachian states. SECARB, led by the Southern States Energy Board (SSEB), Norcross, GA, represents the 11 southeastern states (Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas and Virginia).

SECARB hopes to accomplish its objectives by identifying the sources and sinks for CO_2: identifying the most promising capture, sequestration, and transport options and infrastructure needs in the region; developing public involvement and education mechanisms; and developing action plans for implementation and technology validation.

The Midwest Partnership also includes a number of Appalachian States including Ohio, Pennsylvania, Kentucky, West Virginia and Maryland.

3. Coal Production Incentives and Challenges

The Energy Policy Act of 2005 (EPACT) has a number of provisions to promote coal production and use, including: repeal of the current 160-acre cap on coal leases; allowing the advanced payment of royalties from coal mines in lieu of continued operation requirements; and a mandate to assess coal resources on federal lands that are not National Parks.

Mountaintop removal of coal began in Appalachia in the 1970s and has been the focus of heightened environmental concerns. Most recently, in June 2006, the Army Corps of Engineers suspended four mountaintop removal coal mining permits in West Virginia following the start of a lawsuit alleging the permits are illegal. All four

[8] http://www.netl.doe.gov/technologies/carbon_seq/index.html;
http://www.netl.doe.gov/technologies/carbon_seq/index.html

permits are for new or expanded mines proposed by Massey Energy. The Army Corps regulates companies seeking mountaintop coal mining permits because they often need to use explosives to blast apart entire hilltops to uncover valuable, low-sulfur reserves. The suit filed by environmental groups is based on concerns that the mountaintop removal technique is harmful to water quality and forest habitats.

Safety in coal mines has received renewed attention at the national level in the past year.[9] As the result of increased mining accidents, Congress is looking into increased oversight of mine safety. Since May 20 seven miners have died, bringing the number of U.S. miners killed this year to 33—compared with 22 last year. Data suggests the higher incident of fatalities is due to the proliferation of smaller, undercapitalized mines. The Department of the Interior's Office of Surface Mining is responsible for carrying out the Surface Mining and Control Act and overseeing the Abandoned Mine Land program.

4. Coal to Liquids and Synthetic Fuels

Producing synthetic fuels, such as Fischer-Tropsch, methanol, from coal has been touted as one of the key ways to help meet the need for U.S. transportation fuels as naturally occurring oil reserves decline.[10] Liquefaction of coal can be accomplished in two basic ways, 1) Direct liquefaction involving complex chemical reactions at high temperatures with the introduction of hydrogen and catalysts; and 2) Indirect liquefaction that requires first gasifying the coal and then converting it to a liquid with catalysts. The technology of liquefaction to produce Fischer-Tropsch fuel was first developed in 1925, but commercial production was abandoned as oil prices declined. The EPACT of 2005 includes financial incentives for coal-to-liquids development, including loan guarantees and tax investment incentives and a $1 billion, three-year authorization.

Current energy hearings have focused on increasing these incentives, despite the fact that DOE did not seek additional funding for projects or research because, according to one DOE official, it is a "mature technology receiving funding from the private sector for evolutionary advances and incremental improvements." Environmental challenges of liquefaction are primarily the increased greenhouse gas emissions from the production process which could be addressed through advancements in IGCC technology. In 2003 DOE announced a 5,000 bpd demonstration project using the process shown above, to demonstrate advanced FT fuel production. The project will co-produce 35 MW of electricity, in Gilberton, PA. Despite rising oil prices, to date there is no commercial coal-to-liquid plant in operation in the United States.

[9] Warrick, J. "Safety Violations Have Piled Up at Coal Mine" Washington Post, Wednesday, January 4, 2006; Page A04

[10] Robert Hirsch, "Peaking of World Oil Production: Impacts, Mitigation and Risk Management," Feb. 2005, SAIC.

B. Oil & Gas

1. Oil & Gas Production Incentives

Much of the federal support for the oil and gas industry is to increase production in less accessible, more costly areas such as coal seams, deep reserves, oil sands and shales, and marginal wells. These "unconventional" oil and gas resources actually exceed the potential of "traditional" resources remaining in Appalachia as indicated below. In addition to synthetic fuels income tax credit, EPACT provides tax credits of $3.00 a barrel-equivalent for oil shale, tight sands, coal seams, and tar sands sold.

Oil and Natural Gas Resource Potential in the Appalachian and Illinois Basins	
Conventional Oil	**2 BBbl**
Unconventional Oil	
Stranded and unconventional oil	2-4 BBbl
Oil sands in place	3-4 BBbl
Oil Shale in place	400 BBbl
Conventional Natural Gas	**20-40 Tcf**
Unconventional Natural Gas	
Coal bed Methane	9-17 Tcf
Gas shales	12-17 Tcf
Tight gas Sands	35-55 Tcf

From: Interstate Oil & Gas Compact Commission, *Mature Region, Youthful Potential, Sept. 05.*

2. Enhanced Oil Recovery

According to DOE, enhanced oil recovery (EOR) methods have the potential to recover an estimated 200 billion barrels of the remaining discovered oil resource in the U.S. EOR processes involve injecting a gas or fluid into the reservoir to increase reservoir pressure or reduce oil viscosity in order to mobilize the oil. Injectants include steam (thermal processes); polymers and gels (chemical processes); and carbon dioxide, nitrogen, and natural gas (gas processes). A fourth process is microbial EOR. In 2003, thermal recovery projects produced 52% of the total oil produced from EOR methods in the U.S., CO_2 projects produced 31%, and other gas injection and chemical methods produced the remaining 17%. CO_2 recovery also can be a way to sequester the CO_2 generated by power plants and other industries. EOR methods are more expensive production methods; however, in the face of continued high oil prices, interest is being revitalized in EOR technologies for increasing recovery.[11]

[11] http://www.netl.doe.gov/technologies/oil-gas

a. Oil Sands

Canada is the leading producer of tar sand reserves in North America, but Appalachia also has oil sands reserves, primarily in Kentucky. Extraction of oil sands typically requires mining and heating the reservoir. One study estimated that two tons of material is needed to produce one barrel of oil. The Canadian tar sands' currently has an output of over 1 million barrels a day, but has also been the focus of public attention about the environmental impacts, particularly the disturbance of land caused by the mining operations and the greenhouse gas emissions from production. With current technology, the Appalachian oil sands are not yet economic to extract, but could be in the future.

b. Oil Shale

The United States holds more than 50 percent of the world's oil-shale resources, the equivalent of 2.6 trillion barrels of oil, of which 1.5 trillion barrels are recoverable. As indicated above, part of this potential lies in the Appalachian and Illinois basins. Tons of rock and three barrels of water are needed to produce one barrel of oil with much higher GHG emissions than conventional oil.[12] Oil shales production also raises a number of other environmental challenges including leaching of salts and toxics from spent shale, disturbance of land and air emissions from the production site. The largest oil shale deposits in the world are in the Green River Formation in parts of Colorado, Utah and Wyoming. However, Oil shale has not been exploited in the US because of its production costs and technological and environmental challenges.

EPACT included provisions for accelerated oil shale development under the Oil Shale and Tar Sands Development Act. During recent hearings on oil shale development, concerns were raised about water rights and the need for a better understanding of the amounts of water that will be consumed to produce oil from shale and to restore the disturbed lands.

3. Deep Trek R&D

To date, less than one percent of all wells drilled in the United States (and only 11 wells in Appalachia and Illinois Basin) have penetrated below 15,000 feet, yet their production accounts for nearly seven percent of domestic production. DOE cost-share projects, dubbed "Deep Trek," focus on developing the advanced technologies needed to tackle drilling and production challenges posed by natural gas deposits lying more than 20,000 feet below the earth's surface. There, drillers and producers encounter extraordinarily high temperatures (greater than 400 °F) and pressures (greater than 15,000 psi), as well as extremely hard rock and corrosive environments. In June, DOE announced seven new awards. The projects selected include Electrochemical Systems Inc., Knoxville, TN, which is developing a high-temperature, rechargeable battery cell to power electronics in drilling and logging systems used in wells where temperatures could reach 482 °F.[13]

[12] Rand Corp., Oil Shale Development in the United States: Prospects and policy Issues, 2005
[13] http://www.netl.doe.gov/publications/press/2006/06036-Deep_Drilling_Technology_Awards.html

4. **Low-Impact Natural Gas and Oil (LINGO) Development**
   LINGO is another DOE public-private funding initiative that hopes to take best advantage of current technologies and practices in ways that minimize adverse environmental impacts from the recovery of oil and gas. At the same time, the initiative seeks to boost the economic recovery of oil and gas by addressing the environmental concerns that block such recovery. The projects will be managed by DOE's National Energy Technology Laboratory as cooperative agreements in which project performers share at least 20 percent of the cost for research and development projects, and at least 50 percent of the cost for demonstration and commercialization projects. DOE funds available under the LINGO initiative total $1.3 million.

C. Electricity

1. **Renewable Energy Production Credits (REPC)**
   The energy bill contained $3.4 billion over ten years in tax incentives to encourage the production of electricity using renewable wind, solar, biomass, and geothermal energy sources, including the first-ever tax credit for residential solar energy systems. REPC now applies to the following resources:

   a. Wind
   b. Closed-loop biomass[14]
   c. Open-loop biomass
   d. Geothermal energy
   e. Small irrigation power (150 kW - 5 MW)
   f. Municipal solid waste
   g. Landfill gas
   h. Refined coal
   i. Hydropower
   j. Indian coal

   The REPC provides a tax credit of 1.5 cents/kWh, adjusted annually for inflation, for wind, closed-loop biomass, and geothermal, increasing in 2005 to 1.9 cents/kWh. Electricity from open-loop biomass, small irrigation hydroelectric, landfill gas, municipal solid waste resources, and hydropower receive half that rate—currently 0.9 cents/kWh. REPC have been critical to spurring the flow of investment in wind and other renewable resources, and the industry has continued to push for longer-term credits to avoid the stagnation in investment that occurred when the extension of the credit was uncertain.

[14] Closed loop biomass refers to the biomass (organic matter) that is planted exclusively for the purpose of production of energy. This does not include biomass waste products such as wood chips, or standing timber. Biomass energy includes direct combustion of organic matter to chemical or biological conversion biomass to fuels. The net energy balance of each bioenergy option is an important factor to consider in determining the economic and environmental benefits.

2. **Wind**

   In addition to production tax credits, the federal government has addressed some of the barriers associated with siting wind facilities on public lands. The Bureau of Land Management (BLM) prepared a Programmatic Environmental Impact Statement (EIS) to evaluate issues associated with wind energy development on Western public lands administered by the BLM. The EIS, which was finalized in late 2005, implements a Wind Energy Development Program within the Department of the Interior, and establishes policies and best management practices for wind energy right-of-way authorizations. These guidelines could also be adapted to use on state-owned land.[15]

   The President's 2007 budget includes $44 million for wind energy research—a $5 million increase over FY06 levels. The research is expected to help improve the efficiency and lower the costs of conventional wind turbine technologies. It will also help develop new small-scale wind technologies for use in low-speed wind environments.

3. **Solar**

   The President's 2007 budget proposes a new $148 million Solar America Initiative—an increase of $65 million over FY06—to help achieve the goal of making solar competitive with other renewable generation by 2015. The Solar America Initiative will accelerate the development of advanced photovoltaic materials that convert sunlight directly to electricity.

   Rather than a mandatory renewable power portfolio standard, current federal policy is to encourage voluntary commitments by providers to provide renewable energy as an option to consumers. The Green Power Partnership enlists large electricity users to purchase a portion of their power as renewable energy, thereby reducing the environmental impacts associated with power generation.

4. **Distributed Generation: Microturbines, Fuel Cells, and Combined Heat / Power**

   EPACT 2005 includes tax credits for a number of advanced distributed generation technologies. Individuals or businesses are eligible to receive up to $1,000/kW for tax credit (or 30% of the cost) for stationary fuel cell power plants and a 10% tax credit capped at $200/kW for microturbine power plants. These credits are intended to increase the economic competitiveness in the near term and help spur purchases that improve production economies of scale in the longer term.

5. **Nuclear Power**

   The 2005 energy bill provides several new programs to encourage investments in nuclear power, including a 1.8 cent-per-kilowatt-hour tax credit for new nuclear generation, and a series of loan guarantees, investment protections intended to cover costs of unforeseen legal or regulatory challenges to plant operations, Price-Anderson Act extensions, and decommissioning trust tax policy changes, which amounts to

[15] http://www.blm.gov/nhp/what/lands/realty/FWS_wind_turbine_guidance_7_03.pdf

about $5.7 billion in benefits for the nuclear industry. The tax credit is for the first 6,000 megawatts of new nuclear-generating capacity and is limited to the first eight years of operation and a total of $125 million per 1,000 MW of capacity.

Wall Street analysts and some nuclear industry officials say they are not sure that those incentives will lead to construction of the first new nuclear plant since 1973, absent a resolution of the long-running fight over the Yucca Mountain nuclear waste repository.[16]

The Global Nuclear Energy Program (GNEP) was announced this year by the Administration as an initiative to build an international coalition to promote advanced nuclear power and address the waste problem through reprocessing. Reprocessing the waste into reusable nuclear fuel for advanced reactors is intended in the long-run to reduce the toxicity and volume of the waste to be stored at Yucca Mountain. This is a reversal of prior U.S. policy to not invest in the R&D of reprocessing because of concerns over nuclear proliferation risks.

D. Alternative Fuels

1. Biofuels

EPACT requires industry to reach a 4 billion gallon renewable fuel production target by 2006. Refiners, importers, and gasoline blenders are expected exceed this target which is based on renewable fuel volumes reaching at least 2.78 percent of the total gasoline used. The requirement increases to 4.7 billion gallons by 2007, and 7.5 billion by 2012. As required by the legislation, U.S. EPA will propose a credit-trading system this summer for ethanol and other renewable fuels aimed at helping establish a "functioning market" for alternative transportation fuels. By 2007, EPA is expected to establish a system that holds individual entities responsible for meeting their portion of the standard. EPACT also extended tax benefits. Ethanol production capacity increased from 3.4 billion gallons in 2004 to 4.4 billion gallons in 2006, with another 2.1 billion gallons of capacity currently under construction

EPACT also provides a 30% tax credit for installation of **alternative fuel stations**, up to a maximum of $30,000 per year. Currently only 556 public “E85” (85% ethanol) fueling stations exist in the U.S., and many more will be needed to increase the use of renewable fuels above the 10% that can be blended into conventional gasoline.

To help reduce the costs of producing advanced biofuels from **cellulosic biomass**, such as agricultural and forestry residues, material in municipal solid waste, trees, and grasses, the President’s 2007 budget increases DOE’s biomass research funding by 65%, to a total of $150 million. The President’s goal is to make cellulosic ethanol cost-competitive with corn-based ethanol by 2012, enabling greater use of this alternative fuel to help reduce future U.S. oil consumption.

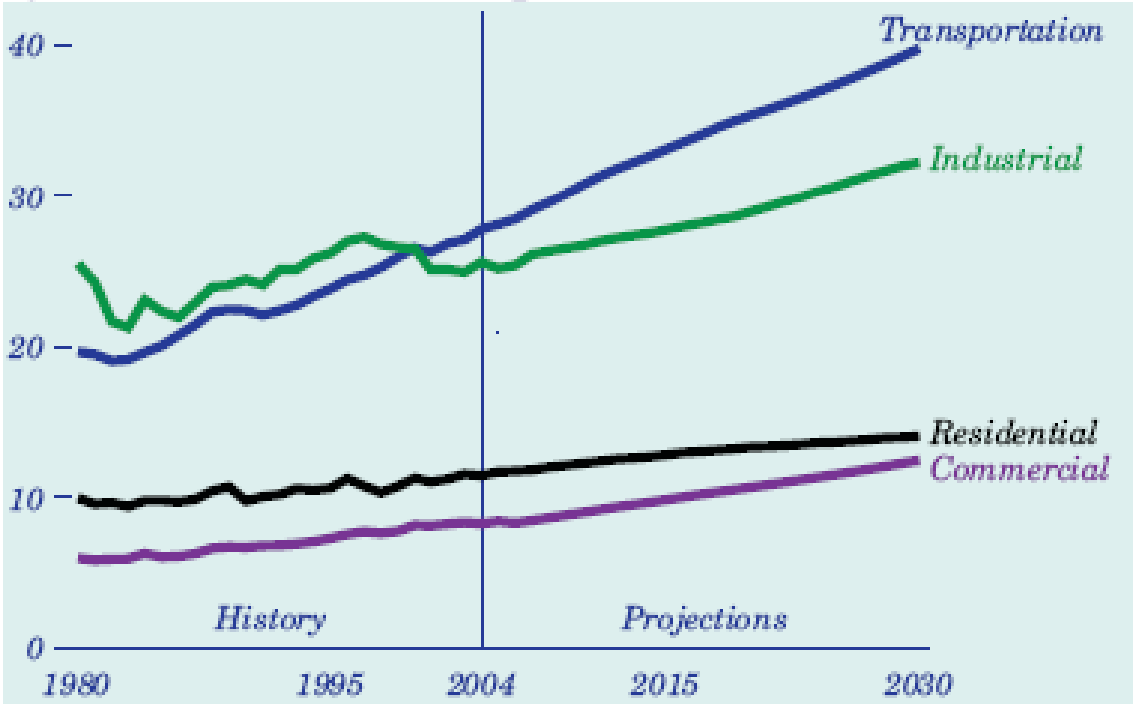
[16] Ken Silverstein, Editor in Chief, EnergyBiz Insider, “Federal Support May not Offset Nuclear Risks,” Jan. 2006. EnergyBiz Insider

2. **Hydrogen**
In his 2003 State of the Union Address, President Bush announced a $1.2 billion Hydrogen Fuel Initiative aimed at developing the technology for commercially-viable hydrogen-powered fuel cells to power cars, trucks, homes, and businesses. The President's 2007 budget includes increased funding for hydrogen technology research to further the administration's commitment to develop competitive hydrogen fuel vehicles by 2012.

II. Demand-Side National Energy Policy Trends

Demand-side policies and programs are focused on reducing the need for energy and encouraging end-users to produce energy more efficiently and closer to the point of end use. As evident in EIA's forecast of energy consumption by sector, the transportation sector has the fastest growing projected energy consumption over the next 25 years. Despite expected increased prices for oil and gasoline over the long term, demand for petroleum will continue to grow, fed by increased per capita vehicle miles traveled and

Figure 2. Delivered energy consumption by sector, 1980-2030 (quadrillion Btu)



A. Energy Efficiency

EPACT includes a number of **tax incentives** to promote implementation of energy efficiency measures and purchase of efficient appliances by residential, commercial, and industrial energy consumers for the years 2006 and 2007.

1. **Residential consumers** can apply for tax incentives for appliances that meet specific, high energy-efficiency standards including:
   a. Central air conditioners
   b. Air and ground-source heat pumps
   c. Furnaces or boilers and furnace blowers
   d. Electric heat pump water heaters
   e. Natural gas, oil, and propane water heaters

   Since most of these highly-efficient appliances currently have a very small market share, the impact of the incentives is likely to encourage the introduction of new models that meet the standard. It is not expected to lead to substantial penetration or energy savings.[17]

2. **Home builders** can receive tax credits for new homes that use 50% less energy than homes built to 2003 standards or manufactured homes that use 30% less than the standard code. Commercial building owners can receive a tax deduction of up to $1.80 per square foot for new building space that reduces energy use by 50% compared to 2001 ASHRAE construction standards or by upgrading two or more existing buildings' systems to achieve 50% efficiency improvements. The building tax incentives also end in 2007.

3. **Homeowners** are eligible for a 10 percent tax credit (up to $500) for improving existing home building envelopes (primarily insulation, roofing material, and windows) to meet model codes for new homes.

4. **Manufacturer Credits**
   Manufacturers of very efficient refrigerators, clothes washers, and dishwashers sold in 2006 and 2007 are also eligible for certain tax credits under EPACT. The level of credits is tiered to give higher credits for higher levels of efficiency. These credits might be passed through partially in consumer prices and should help achieve market penetration of these appliances.

5. **Appliance Standards**
   EPACT also set first-time energy efficiency standards for 14 large appliances and raised existing standards for others. Appliance standards are the most effective way to achieve market transformation to more energy-efficient appliances and are preferably set at the national level. Many of the new federal standards are "catching up" with California's lead in increasing the efficiency standards for appliances.

[17] ACEEE, "The Federal Energy Policy Act of 2005 and its Implications for Energy Efficiency Program Efforts." Sept. 2005.

6. **Technical Assistance for Voluntary Efficiency Commitments**
   DOE and EPA also sponsor a number of voluntary partnership programs that are intended to encourage commitments by industries, states, and the commercial and institutional sectors to best practices in energy efficiency in exchange for technical assistance including:[18]

   a. EPA's Clean Energy-Environment State Partnership Program is a voluntary state-federal partnership to encourage states to develop a comprehensive strategy for using existing and new energy policies and programs to promote efficiency, clean distributed generation, renewable energy, and other clean energy sources.
   b. The Combined Heat and Power Partnership works with industry, state and local governments, universities, and other energy users to facilitate the development of clean, efficient combined heat and power projects.
   c. ENERGY STAR Product Certification Program to encourage investments in energy efficiency by clearly defining products, new homes, and practices that save energy without any sacrifice in desired features.
   d. The SmartWay^{SM} Transport Partnership is a voluntary collaboration between U.S. EPA and the freight industry designed to increase energy efficiency while significantly reducing greenhouse gases and air pollution.

B. Transportation

The administration increased fuel efficiency standards (CAFÉ) for light trucks and SUVs for the first time in a decade, raising the standard from 20.7 mpg to 22.2 mpg for the current model year 2007 vehicles.

EPACT includes income tax credits of up to $3,400 per vehicle for purchasers of hybrid vehicles, and the Energy Tax Incentives Act of 2005 includes additional "green" vehicle incentives for purchasers of fuel cell, advance lean burn diesel, and other alternative fuel vehicles. The new law provides a substantially higher tax benefit for hybrid vehicles than the preceding one. In 2005, sales of hybrid vehicles exceeded 200,000 for the first time ever, based in part on tax incentives.

To help bring down the cost of plug-in hybrid vehicles, the President's 2007 budget includes $31 million in new research funding to support advanced battery research, a 27% increase over 2006 levels.

Challenges and Opportunities for Appalachia

The Appalachian Regional Commission and the individual Appalachian states can take advantage of the national energy initiatives by positioning the region to compete effectively for research and demonstration funding, by educating businesses and consumers about federal incentives, and by leveraging federal programs with additional state and ARC resources to maximize energy goals for the region. Below are some specific suggestions and some challenges for consideration by the Energy Advisory Board.

[18] For a list of all the programs on EPA's website: http://www.epa.gov/partners/programs/index.htm#regional

Challenges	Possible ARC Opportunities
Affordable and stable energy prices are important to a healthy economy, but state and regional policies can not make substantial impact on global energy costs.	States do have the ability to significantly increase efficiency of energy use. Encouraging utilities and state agencies to tailor their energy-saving programs to take advantage of and complement new federal tax incentives.
Utilities are reluctant to invest in unproven technologies such as IGCC without some protection against lower than expected performance, higher than expected costs and regulatory risks.	ARC can provide education and promotion of the federal incentive programs, technical assistance and funding partnership programs to advance new technologies in clean energy.
Future production of oil & gas from unconventional sources will require use of new technologies and practices. Small independent firms, who make up the majority of oil & gas producers in the region, will need both technical and financial assistance to adopt the advanced production approaches.	Strong regulatory oversight of production and use of energy, particularly its environmental impacts, will be important in safeguarding the public's interests and confidence. ARC could work to identify and encourage best practices among Appalachian states, particularly in establishing new regulatory frameworks for CO_2 storage. Development of remaining oil, gas and coal resources will require collaboration between states, industries and the federal government in developing the needed infrastructure, including data collection and analysis, technology transfer and construction of pipelines and other distribution systems. ARC can help coordinate these partnerships.
Although the US does not have a national climate policy, many of the firms operating in Appalachia have interests in other countries that do, and are also operating in states that have adopted climate policies.	Identifying the energy practices and investments that have the greatest overall returns under a number of carbon management scenarios (i.e. under different carbon caps or prices) could help investors and policymakers better weigh the risks and opportunities of future domestic climate policy at the state or national level.