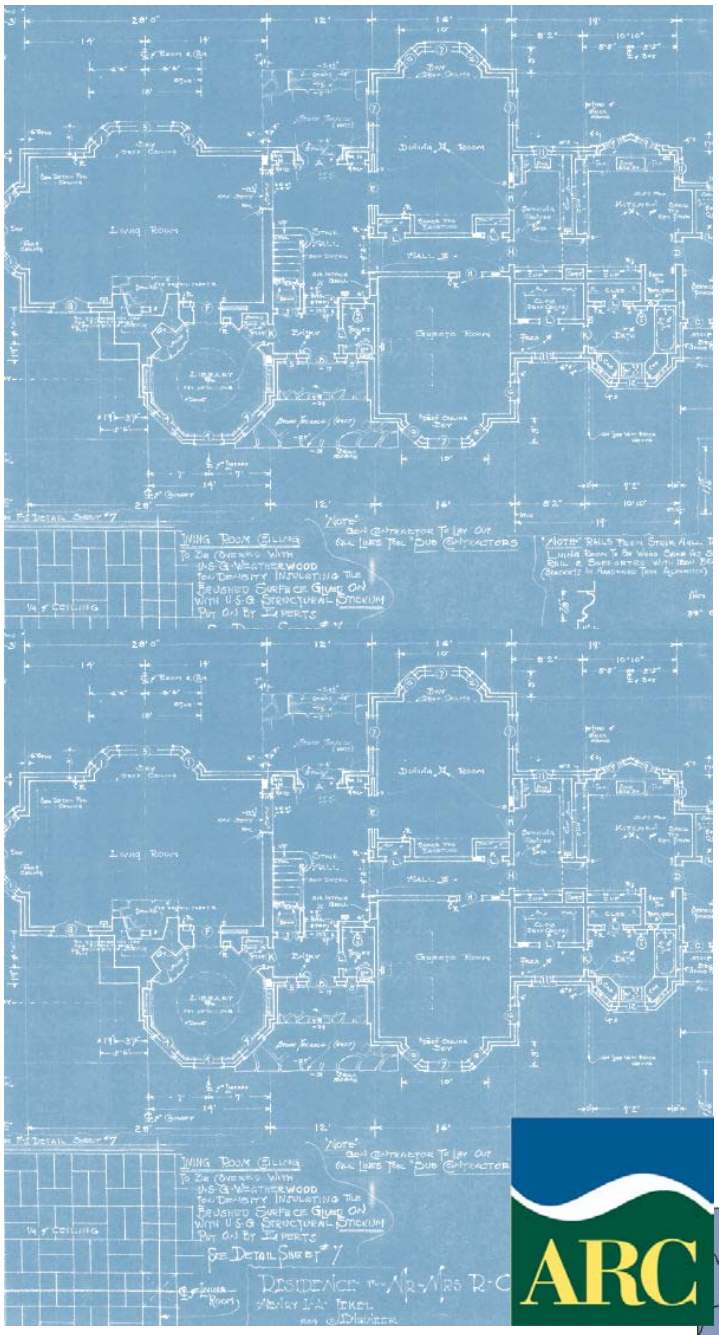
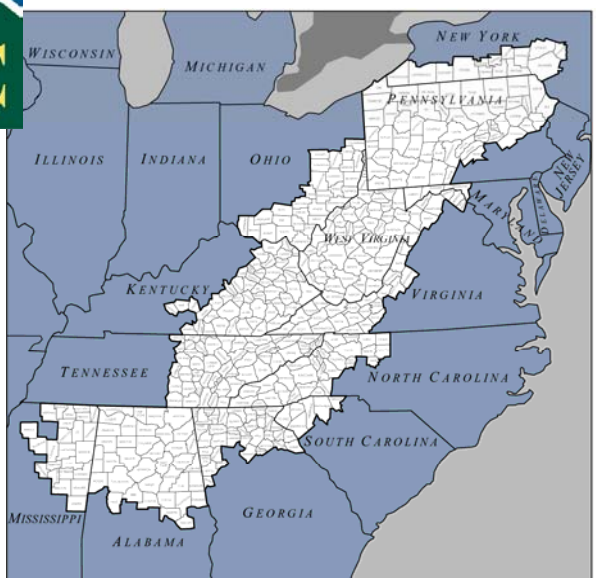


National and State Energy Policy Trends

Appalachian Region Energy Blueprint Research Brief

August 2006



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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.

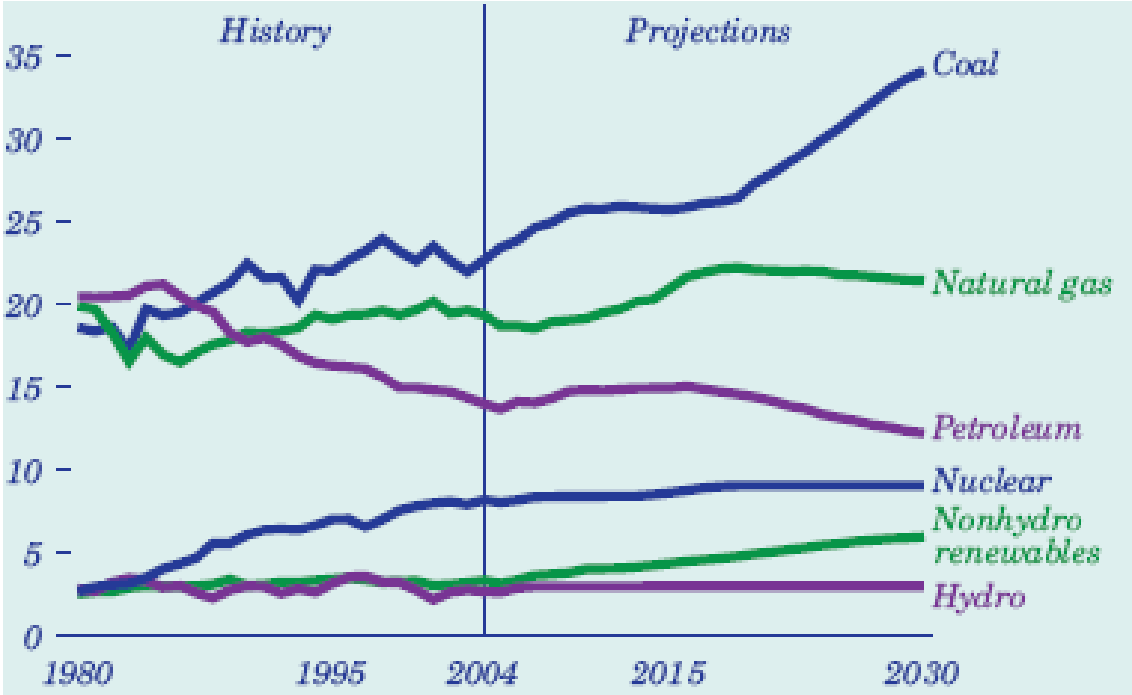
[1] This is not intended to be a comprehensive review of national energy policy, rather a summary of those policies and programs that are most relevant to the Appalachian region.

- *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.

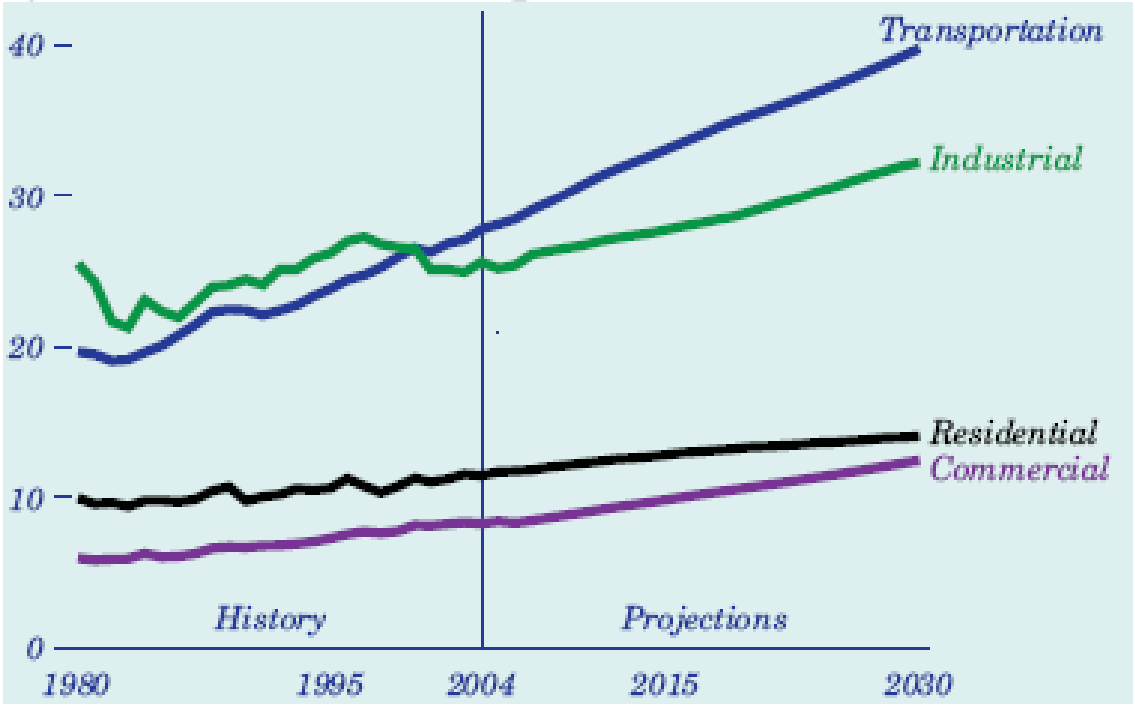
[16] Ken Silverstein, Editor in Chief, EnergyBiz Insider, “Federal Support May not Offset Nuclear Risks,” Jan. 2006. EnergyBiz Insider

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.

Appalachian States Energy Policy/Program Trends[19]

I. Supply Side

As was stated above, 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.

A. Coal

1. Production Tax Incentives

Production tax incentives for coal provide project owners with tax incentives (generally in the form of tax credits) for producing coal. Although coal is a major Appalachian resource, only Alabama and Virginia have production incentives for coal.

2. Indigenous Coal Use Incentives

Indigenous coal use (or employment) incentives provide tax incentives (usually tax credits) for use of coal produced in a given state in energy generation or manufacturing. Kentucky, Maryland, and Virginia have these incentives. Only Virginia has both production incentives and use incentives.

3. Clean Coal Incentives

Clean coal incentives offer tax credits or other benefits for construction of new facilities based on clean coal technologies. Kentucky, New York, Ohio, and Pennsylvania currently have such incentives in place.

4. Environmental Policies

Environmental policies that impact coal development can take a variety of forms. In accordance with the federal Clean Air and Clean Water Acts, all Appalachian states have standards regarding emissions to air and water. Of note among these policies are stricter regulations for mercury emissions that are being considered in North Carolina[20], New York[21], and Pennsylvania[22]. These regulations, if implemented, would certainly affect coal facilities in these states. Maryland recently passed its "4 Pollutants" initiative, which increases restrictions on emissions of sulfur dioxide, nitrogen oxide, particulate matter, and carbon dioxide.[23] This regulation will affect coal facilities in Maryland. Several Appalachian states offer tax incentives for the purchase of pollution control technologies.

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[19] References and resources on state policy resources are in Appendix A.
[20] North Carolina Mercury Rule. http://daq.state.nc.us/rules/rules/D537-541.pdf
[21] "Governor Announces Major Initiative to Reduce Mercury Emissions." May 25, 2006. http://www.ny.gov/governor/press/06/0525063.html
[22] Pennsylvania's Proposed Mercury Reduction Rule. http://www.dep.state.pa.us/dep/deputate/airwaste/aq/regs/Mercury_Rule.htm
[23] "Maryland to Join Eastern States in Regulating Carbon Dioxide." April 4, 2006. http://www.ens-newswire.com/ens/apr2006/2006-04-04-09.asp

5. **Production Taxes**

Management of federal production royalties and state severance taxes offer another opportunity for states to affect production and use of coal in Appalachia. When the United States government leases public lands for mineral production, it pays part of the income to the state where the leased land is located. Federal law requires that a portion of the royalty funds be given back to the local governments where the mineral extraction occurred. Likewise, several states in Appalachia require severances taxes on all coal production within the state, usually based on a per-ton rate or a percentage of the revenue. Alabama, Ohio, Tennessee, Kentucky, Virginia, and West Virginia all have state severance taxes at varying levels. The level, distribution, and use of these funds can be designed to incentivize production, address environmental remediation, or encourage certain production methods and technologies.

West Virginia is one of several states that also imposes an export tax on coal. In the case *U.S. Steel Mining Co. et al. v. Helton*, the coal companies are arguing that West Virginia's tax on exported coal is illegal because the Constitution's "Import-Export" clause prohibits state governments from imposing any "imposts or duties on imports or exports." On appeal to the Supreme Court is a May 2004 ruling by Kanawha Circuit Court that upheld the West Virginia severance tax imposed on all coal mined in the state. The court found that the tax does "not infringe upon the federal government's ability to speak with one voice when regulating foreign commerce." The state Supreme Court upheld the lower court's decision in December 2005.[24]

6. **Other Leading State Policies**

California and **Wyoming** have entered into a Memorandum of Understanding (MOU) to create a joint IGCC task force to take advantage of federal funding opportunities to help develop a commercial-scale integrated gasification combined cycle coal project with carbon sequestration in Wyoming.[25] The California Energy Commission, the Public Utilities Commission, and the Governor's Climate Action Team have all recommended that any long-term investments in new power generation for California have a greenhouse gas emission characteristic that is equal to or better than a state-of-the-art IGCC plant.

Coal Barriers/Challenges	Possible ARC Opportunities
Clean coal technologies hold promise for increasing use of Appalachian coal for energy production. However, there is concern about the difficulty of permitting clean coal facilities, such as those using integrated gas combined cycle (IGCC) and carbon capture and sequestration (CCS) technologies.	In order to facilitate future permitting of IGCC and CCS plants, states need more information about these technologies. ARC could invite state regulators to participate in a roundtable discussion of how to streamline the permitting process for IGCC and CCS facilities.

[24] Greenwire, May 5, 2006 & Sept. 21, 2005

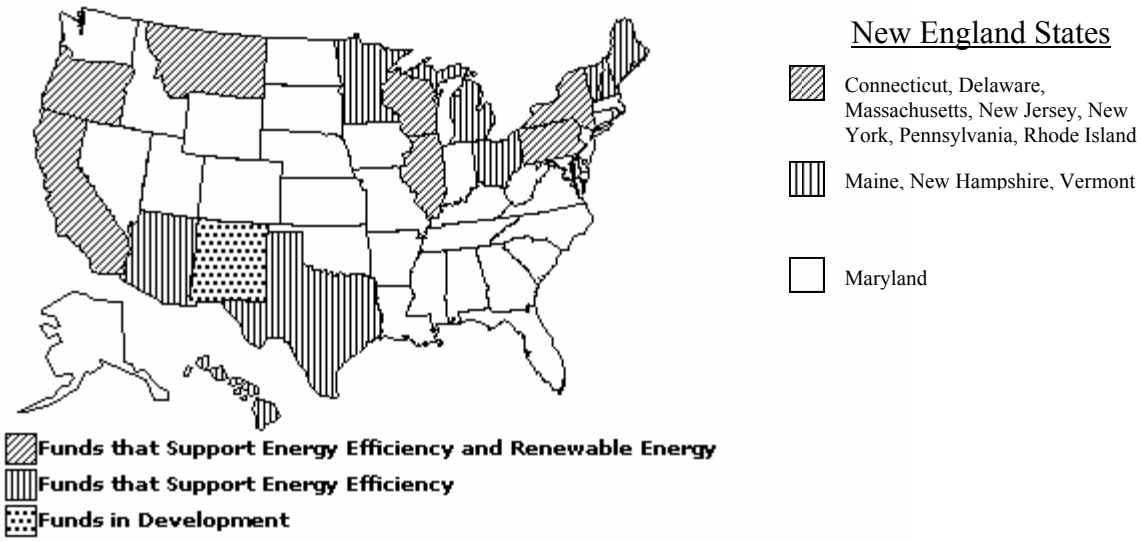
[25] "California and Wyoming Sign Agreement on Development of Clean Coal Technology." April 19, 2006. http://www.schwarzenegger.com/news.asp?id=2153

Coal Barriers/Challenges	Possible ARC Opportunities
Capital costs for IGCC facilities are substantial.	ARC could serve as a broker for funding for IGCC facilities in Appalachian states.

B. Electricity

1. Systems Benefit Funds

Systems (or public) benefit funds are programs developed through the electric utility restructuring process as a measure to assure continued support for renewable energy resources, energy efficiency initiatives, and low-income support programs. Such funds are commonly supported through a charge to all customers on electricity consumption, e.g., 0.2 cents per kilowatt hour of energy used. New York, for example, applies some of the proceeds from its systems benefits fund to research innovative energy technologies. Systems benefit funds are generally supported through a charge to all customers on electricity consumption. In addition to New York, only Ohio and Pennsylvania currently have systems benefit funds. However, several other states have expressed an interest in examining the possibility of implementing systems benefits funds in the future.



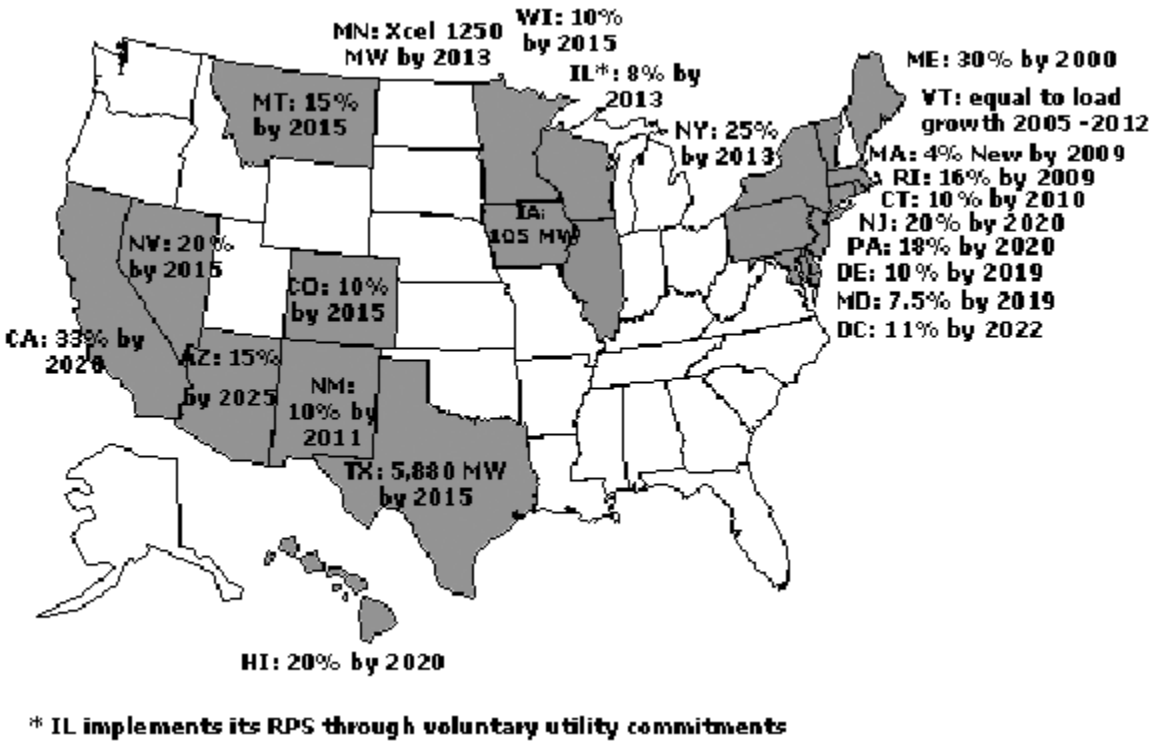
Source: Pew Center on Global Climate Change

2. Policies for Demand Response

Demand response (or load management) programs allow electricity customers to reduce their energy consumption at critical times or in response to market prices. All Appalachian states except Mississippi and Tennessee have some sort of demand response program.[26]

[26] http://www1.eere.energy.gov/femp/program/utility/utilityman_energymanage.html

3. **Resource Portfolio Standards**
   Resource portfolio standards require that a certain percentage of a utility's overall or new generating capacity or energy sales must be derived from renewable resources, such as requiring that 1% of electric sales be from renewable energy in the year 2010. Portfolio Standards most commonly refer to electric sales measured in megawatt hours (MWh), as opposed to electric capacity measured in megawatts (MW). Currently, only Maryland, New York, and Pennsylvania have renewable portfolio standards. However, several other states have expressed an interest in exploring the possibility of implementing such standards in the future.



Adapted from Pew Center on Climate Change

4. **Energy Efficiency Resource Standard (EERS)**
   An EERS requires energy providers to meet quantitative targets for energy savings, typically in the electricity and natural gas sectors. State public utility commissions or other regulatory bodies specify explicit numerical goals that must be met on an annual and cumulative basis. An EERS may specify that implementation will involve coordination with a public benefit fund (PBF)[27] and may be linked to a renewable portfolio standard (RPS). In Appalachia, only Pennsylvania has an EERS.

5. **Generation Disclosure Requirements**
   "Disclosure" refers to the requirement that utilities provide their customers with additional information about the energy they are supplying. This information often

[27] www.keystone.org/ceetf background document for

includes fuel-mix percentages and emissions statistics. Maryland, New York, Ohio, Pennsylvania, and Virginia have generation disclosure requirements.

6. Other Leading State Policies

Massachusetts regulations include a four-pollutant cap on emissions for six coal power plants.[28] In addition to limits on emissions of sulfur dioxide, nitrogen oxide, and mercury, Massachusetts also requires plants to reduce their carbon dioxide emissions. There are no requirements about how reductions must be made, although the state does have a preference for conversion of plants from coal to natural gas. Deadlines for achieving the new standards are delayed for any plant that converts to natural gas.

Statewide Renewable Portfolio Standards have now been adopted by 13 states and efforts are beginning to establish and coordinate these programs regionally. **California, Colorado, Texas, and most of the Northeast states** are among the states that have implemented the RPS through a Renewable Energy Credit (REC) Trading System**.** REC trading among load serving entities is designed to achieve the RPS standard more cost-effectively and allow better tracking of transactions and compliance**.** [29]

Electric Power Barriers/Challenges	Possible ARC Opportunities
As is indicated above, several states have expressed an interest in pursuing systems benefit funds and renewable portfolio standards. Documents prepared by these states suggest that state officials want to assess the feasibility of these policies and study their potential impacts to the economy.	1. ARC could provide research or assessment funds to assist in these efforts. 2. ARC could host conference calls or discussion groups in which states who currently have systems benefits funds and/or renewable portfolio standards could share their knowledge and experience with other states.
Some states in Appalachia are experiencing electricity supply problems. Others are concerned about minimizing risk of supply disruptions in the future.	ARC could initiate and/or host a regional energy compact and regional planning for energy supply/infrastructure redundancies.

C. Natural Gas and Oil

1. Production Incentives for Natural Gas and/or Oil

Alabama, New York, Pennsylvania, Virginia, and West Virginia offer production incentives for natural gas. Alabama, Kentucky, New York, and West Virginia offer

[28] "Greenhouse and Statehouse: The Evolving State Government Role in Climate Change." Barry G. Rabe, Pew Center on Global Climate Change. November 2002. http://www.pewclimate.org/global-warming-in-depth/all_reports/greenhouse_and_statehouse_/index.cfm

[29] EPA, Clean Energy-Environment Guide to Action for States, Chapter 5.1, 2006. www.epa.gov/cleanrgy/stateandlocal/guidetoaction.htm

incentives for oil production. These incentives generally take the form of tax credits for produced natural gas or oil. Other incentives include tax exemptions for resource studies and permit exemptions. Alabama offers incentives for offshore deep wells.

2. **Enhanced Oil Recovery Incentives**
   Enhanced recovery techniques allow for extraction of additional reserves of oil and/or prolonged production in more mature wells. By increasing production efficiency, enhanced oil recovery can extend the economic life of older wells that can no longer be tapped by traditional extraction methods. Enhanced recovery techniques include gas re-injection, carbon dioxide flooding, and horizontal drilling. Alabama, Mississippi, and Virginia offer incentives for enhanced oil recovery.

3. **Streamlined Permitting and/or Reporting**
   Streamlined permitting and/or reporting can take a variety of forms. In Appalachian states, these include allowing well completion statements to serve as hazardous chemical inventories and electronic permit applications. Ohio and Pennsylvania have these policies.

4. **Other Leading State Policies**
   California's Liquefied Natural Gas Interagency Permitting Working Group[30] works closely with agencies who are involved in the permitting process for any LNG facility in the state. The Working Group also provides guidance to potential LNG developers on how to navigate the state's permitting process.

   Kentucky and Wyoming are among several states that have created state energy infrastructure authorities that can finance (through revenue bond) and build new projects not being advanced by the private sector. Kentucky's Oil and Gas Infrastructure Authority is specifically created to support natural gas and coal bed methane storage, gathering, and transportation projects.[31]

   Virginia passed legislation to help facilitate oil and gas production form coal bed methane where mineral rights are in dispute. As is often the case when prior coal developers and current oil and gas developers are two different entities, lengthy litigation is often the only avenue for resolving multiple claims. The Virginia law passed in 1990 requires pooling of proceeds from production in an escrow account while the dispute is legally settled.[32]

[30] http://www.energy.ca.gov/lng/working_group.html
[31] DOE, Interstate Oil and Gas Compact Commission, *Mature Region, Youthful Potential, Oil and Natural Gas Resources in the Appalachian and Illinois Basins*, Sept. 2005
[32] DOE IOGCC

Natural Gas Barriers/Challenges	Possible ARC Opportunity
Several states have expressed interest in expanding natural gas production, storage, and delivery. However, they must first do feasibility and impact assessments.	ARC could provide funds for feasibility and impact assessments.
Some states have identified problems with natural gas distribution. Insufficient pipeline capacity is of particular concern.	ARC could fund a study or convene a discussion group examining natural gas distribution problems and possible solutions.

D. Alternative Fuels

1. Production Incentives for Biofuels

Kentucky, Maryland, Mississippi, South Carolina, and Virginia offer production incentives for biofuels, such as ethanol and biodiesel. These incentives generally take the form of tax credits for produced fuel.

2. Other Leading State Policies

A new law in **Michigan** creates incentives for the production, distribution, and purchase of ethanol-based alternative fuels.[33] A more expansive law in **Louisiana** provides for a new mandate that ethanol produced from domestic biomass material comprise two percent of all the gasoline sold in the state.[34] This mandate would go into affect six months after the state produces 50 million gallons of ethanol or ten million gallons of biodiesel. **Washington** is pursuing legislation to require fuel companies to sell 20 million gallons of biodiesel each year and have biodiesel comprise at least two percent of the state's total diesel sales.[35]

Biofuels Barriers/Challenges	Possible ARC Opportunity
Several states would like to increase production and on-road delivery of biofuels. 1. Coordination of production and delivery across states could minimize harmful duplication or omission of services and service areas. 2. Increased demand for biofuels would make expansion of production and delivery of biofuels more feasible.	ARC could: 1. Help coordinate planning of biofuels production and delivery across Appalachia by hosting a database of planned and implemented projects. 2. Help states coordinate efforts to attract facilities that produce alternative fuel vehicles that run on biodiesel.

[33] "Granholm Says Alternative Energy Development Critical to Diversifying Economy." April 7, 2006. http://www.michigan.gov/gov/0,1607,7-168-23442-146879--,00.html

[34] "Governor Blanco signs HB 685." June 12, 2006. http://www.gov.state.la.us/index.cfm?md=newsroom&tmp=detail&articleID=1945

[35] "Washington State Adopts Biodiesel Requirement." March 30, 2006. http://www.biodiesel.org/resources/pressreleases/gen/20060330_wa_b2.pdf

II. Demand-Side Policies/Programs

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.

A. Renewable Energy (RE)

1. Renewable Energy Investment Incentives

Every Appalachian state except Georgia, North Carolina, and Tennessee has some sort of incentive for residential and/or business consumers to invest in renewable energy technologies. These programs include state loans, grants, rebates, and tax incentives for the purchase and installation of renewable technologies for local (residential or business) solar, wind, and geothermal energy production and use.

2. Production Incentives for Renewable Energy

These incentives, which were mentioned above as a type of supply-side policy, also serve as demand-side policies. Production incentives encourage residential and business consumers to invest in renewable technologies for their own use and/or for contribution to the larger local energy supply (see Interconnection and Net-Metering below). This use of renewable energy decreases their demand on other energy sources. In Appalachia, only Alabama, Kentucky, South Carolina, Virginia, and West Virginia do no have production incentives for renewable energy.

3. Interconnection Standards

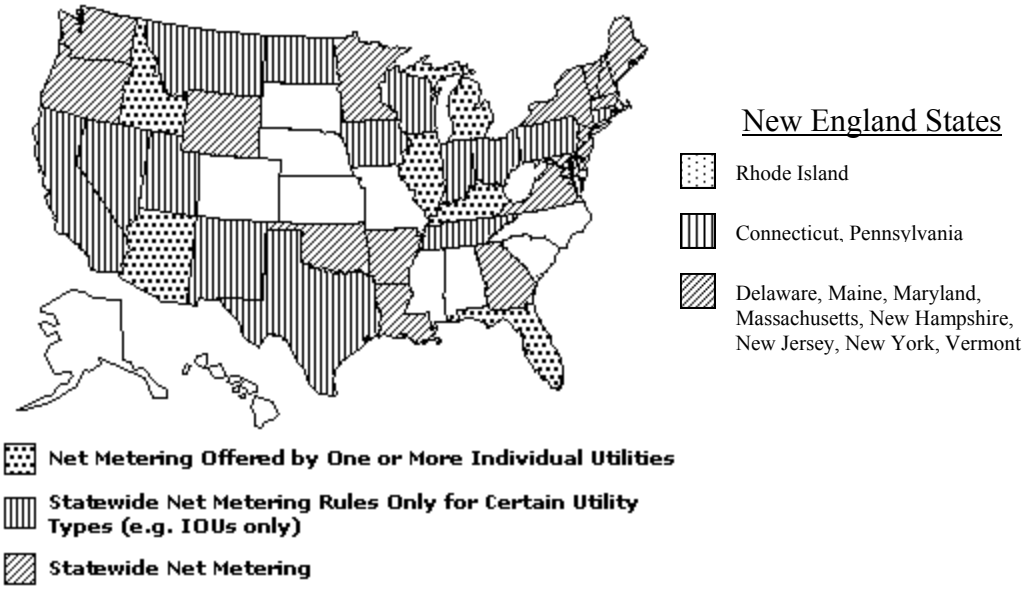
Interconnection standards regulate how distributed sources of energy (like residential and commercial production of renewable energy) can be connected to the larger energy power system. The lack of uniform installation and interconnection requirements can result in technical and economic inefficiencies, interconnection delays, and unnecessary expenses. Many Appalachian states have interconnection standards: Georgia, Maryland, New York, North Carolina, Ohio, Pennsylvania, and Virginia.

4. Green Power Purchasing Requirements

States or other government entities can require that government agencies buy electricity from renewable resources. Green power purchasing can be required for municipal facilities, streetlights, water pumping stations, government buildings, etc. Maryland, New York, Pennsylvania, and South Carolina have green purchasing requirements.

5. Net Metering Rules

For those consumers who have their own electricity-generating units, net metering allows for the flow of electricity both to and from the customer through a single, bi-directional meter. During times when the customer's generation exceeds his or her own use, electricity from the customer to the utility offsets electricity consumed at another time. Most Appalachian states have net metering rules: Georgia, Kentucky, Maryland, New York, North Carolina, Ohio, Pennsylvania, and Virginia.



Adapted from Pew Center on Global Climate Change

6. **Alternative Fuel and Alternative Fuel Vehicle Incentives and/or Requirements**
   States can provide incentives for the consumption of alternative fuels through tax exemptions on fuel, tax rebates or credits for alternative fuel vehicles, and other mechanisms. They can also require that state or other vehicle fleets consist of alternative fuel vehicles. All Appalachian states except Alabama have one or mechanisms for encouraging consumptions of alternative fuels.

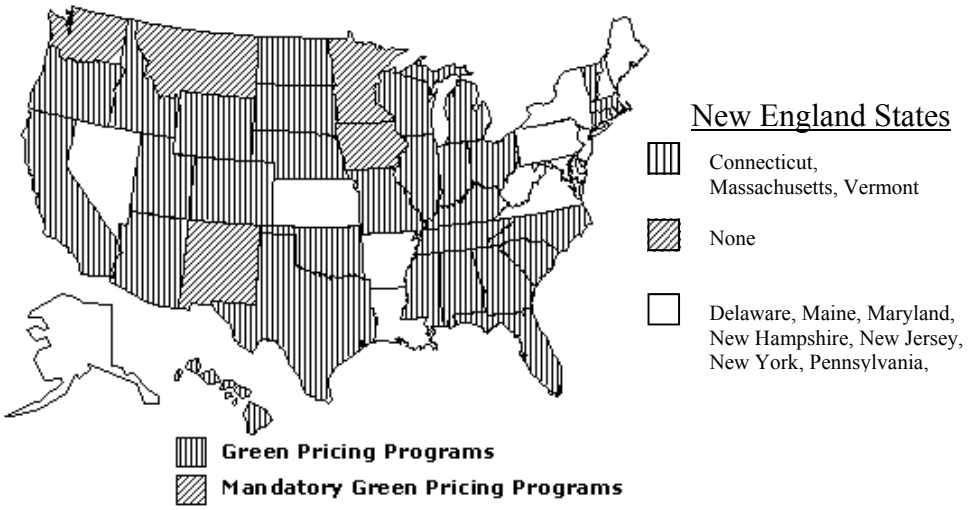
7. **Other Leading State Policies**
   The **Connecticut** Clean Energy Fund (CCEF) is offering $21 million in financial support to stimulate demand for installations of distributed renewable energy at commercial, industrial, and institutional buildings in Connecticut.[36] Support is available for projects that reduce the cost of energy-generating equipment for solar, fuel cells, wind, biomass, landfill gas, and hydropower though the On-Site Renewable Distributed Generation Program.

   In **New Jersey**, combined federal and state tax credits have lowered the price of a $27,000 residential solar electric system to $10,000. **Oregon** offers a Business Energy Tax Credit designed to stimulate investment in energy conservation, renewable energy, recycling, and renewable fuels. The credit offers 35% of eligible project costs (incremental cost beyond standard practice).[37]

   The **Western Governors' Association** is working with the California Energy Commission to create the Western Renewable Energy Generation Information System, a voluntary system for renewable energy credits that tracks renewable energy credits across the region to facilitate trading to meet renewable energy portfolio standards.[38]

[36] "On-site Renewable DG Program."
http://www.ctcleanenergy.com/investment/onsite_renewable_dg_program.html
[37] ACEEE, Energy Efficiency Tax Incentives, 2006.
[38] http://www.westgov.org/wieb/wregis/

8. **Green Pricing**
   Utilities can offer customers the option to pay a premium on their electric bills to have some or all of their power provided from renewable sources. While the electricity generated by renewable sources is not delivered directly to the customers who pay for it, the utility certifies that renewable energy has been generated in an amount equal to the customer's purchase. Eight Appalachian states offer green pricing: Alabama, Georgia, Kentucky, Mississippi, North Carolina, Ohio, South Carolina, and Tennessee.

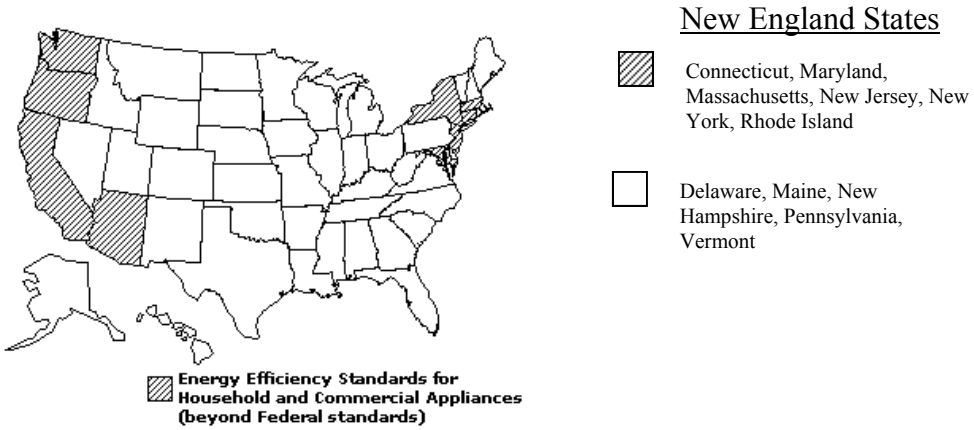


Adapted from Pew Center on Global Climate Change

B. Energy Efficiency

1. **Investment Incentives for Energy Efficiency Technologies**
   Many Appalachian states offer investment incentives for energy efficiency technologies: Alabama, Georgia, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, and West Virginia. These incentives generally take the form of rebates, grants, loans, or sales tax exemptions. Eligible technologies generally include weatherizing, efficient home appliances (including heating and cooling systems), energy-efficient windows and other building materials, and combined heat and power production.

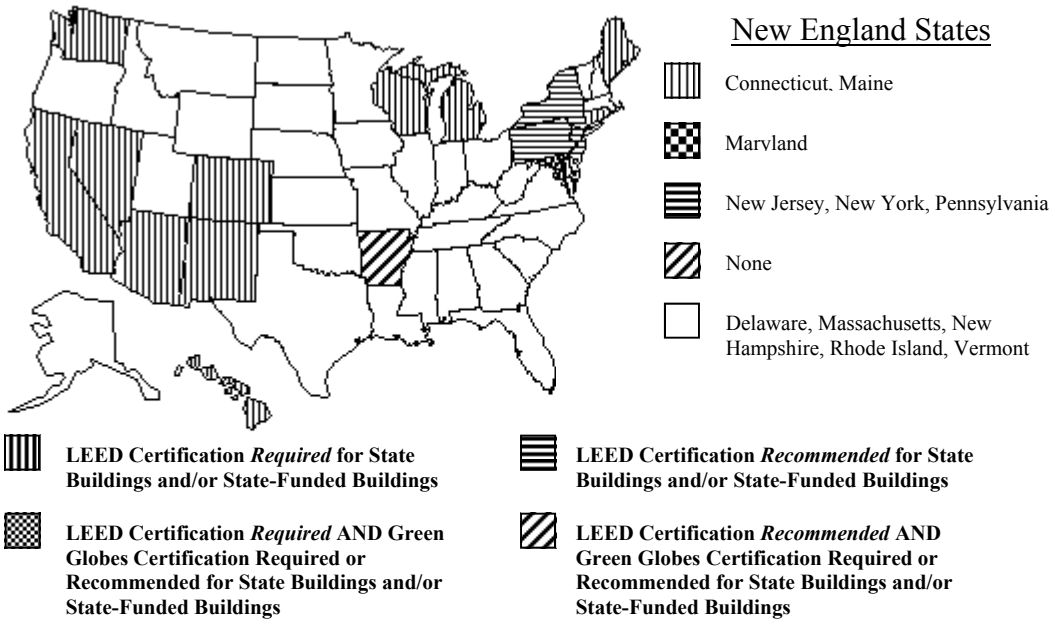
2. **Appliance Efficiency Standards**
   Maryland and New York have set minimum energy efficiency standards for products that are not covered by mandatory federal standards. A waiver from the U.S. Department of Energy is required before states can set standards for products covered by existing federal standards. New York's appliance efficiency standards are very comprehensive and quite ahead of most other states.



Adapted from Pew Center on Global Climate Change

3. **Green Building Standards**

Green building standards provide a framework for encouraging and assessing energy efficiency in building. Green building standards emphasize state-of-the-art strategies for sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality. The U.S. Green Building Council's LEED (Leadership in Energy and Environmental Design) standards are the most common building standards. The Green Building Initiative has also created a green-building verification program. Three Appalachian states have green building standards: Maryland, New York, and Pennsylvania.

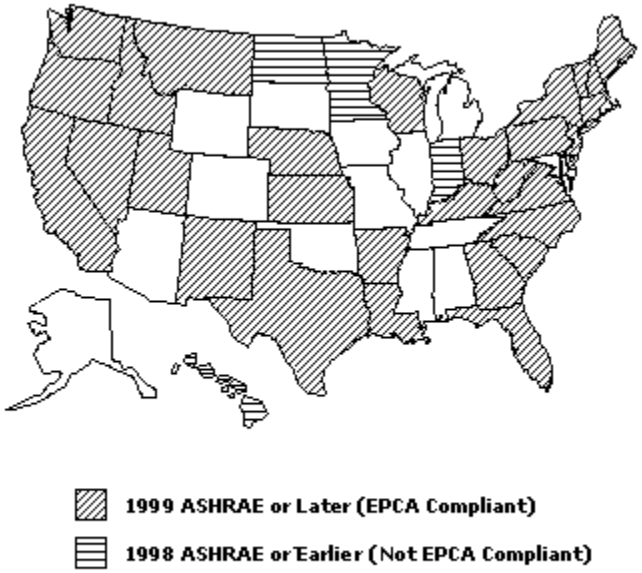


Adapted from Pew Center on Global Climate Change

4. **Energy Codes (Residential and Business)**

Energy codes establish a minimum level of energy efficiency for buildings. Generally, codes specify requirements for "thermal resistance" of the building shell and windows, and minimum heating and cooling equipment efficiencies. Energy codes can target residential and/or commercial buildings. International Energy Conservation Codes (IECC) introduced before 1998 and American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards introduced before 1999 do not meet the requirements of the federal Energy Conservation and Production Act (ECPA). All but three Appalachian states (Alabama, Mississippi, and Maryland) have energy codes for residential buildings. All but Alabama, Mississippi, Maryland, and Tennessee have energy codes for commercial buildings.

Commercial Energy Codes



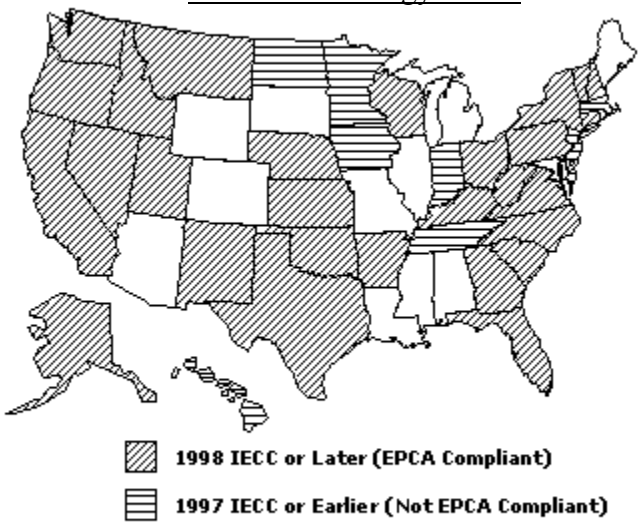
New England States

Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, Vermont

Delaware, New Jersey, Pennsylvania

Maryland

Residential Energy Codes



New England States

Connecticut, Delaware, New Hampshire, New York, Pennsylvania, Vermont

Massachusetts, New Jersey

Maine, Maryland, Rhode Island

Adapted from Pew Center on Global Climate Change

5. **Output-Based Regulations**

Output-based regulations encourage efficient energy generation by establishing emission performance criteria for energy generation (for instance, tons of nitrogen oxides (NOx) per megawatt hour (MWh) generated rather than the more traditional emission limits of tons of NOx per British thermal unit of heat input.) In some cases, states have made provisions that allow energy efficiency and renewable energy to compete equally with other methods of reducing emissions by setting aside a pool of emission allowances for eligible EE/RE projects.[39] Maryland, New York, and Ohio have output-based regulations.

6. **Other Leading State Policies**

A number of states have adopted building efficiency and purchasing requirements for state facilities to both reduce energy costs and lead-by-example. The **Oregon** State Energy Efficiency Design Program requires energy conservation that is 20% beyond code standards for state facility renovation and construction projects.

New Hampshire requires state agencies to reduce energy use by 10%. Equipment purchases must have ENERGY STAR rating. State facility construction and renovations must exceed code by 20%. Clean fleets programs require state vehicles to achieve a minimum of 27.5 mpg (highway).

California has the most extensive and long-standing appliance efficiency standards. The state's standards preceded national standards.

A number of states, including **Pennsylvania**, **California**, and **Connecticut**, have adopted Energy Efficiency Portfolio Standards that are typically an expansion of the renewable energy portfolio requirements. The **Texas** Public Utility Commission adopted energy efficiency goals for utilities as a part of the implementation process for the state's 1999 restructuring law. Electric distribution utilities were required to offset 10% of forecasted load growth through energy efficiency. To achieve this goal, the utilities were required to provide incentives through standard offer programs or targeted market transformation programs. Incentives were to be paid to energy services companies or retail electric providers for the implementation of the energy efficiency programs. [40]

EPA and state environmental agencies offer Supplemental Environmental Projects (SEPs) as an option for partial settlement of violations of environmental regulations. An SEP allows the regulated entity to develop an environmentally-beneficial project in lieu of part of its fine, which often takes the form of energy efficiency projects that benefit the public. For instance, the settlement of an enforcement case in **Texas** funded the purchase of alternative fuel buses and vehicles in Odessa and Houston. A

[39] EPA Clean Energy-Environment , Chapter 5.3, 2006 www.epa.gov/cleanrgy/stateandlocal/guidetoaction.htm
[40] http://www.keystone.org/html/documents.html#eeportfolio

South Carolina utility implemented $1 million worth of energy efficiency measures as the result of an SEP.[41]

RE and EE Barrier/Challenge	Possible ARC Opportunity
Regional planning and implementation of renewable energy and energy efficiency policies and programs is disjointed.	ARC could coordinate regional planning of RE and EE policies by hosting a database, meetings, and/or conference calls.
Creating demand for RE and EE technologies is a critical factor in growing this sector.	ARC could host discussions about regional criteria for green building.

C. Statewide Energy Planning[42]

Eight Appalachian states have comprehensive, statewide energy plans. These plans indicate a likely trajectory for energy policy in the region over the next five to ten years. In addition to addressing many of the issues discussed above, state energy plans tend to include policy plans or recommendations regarding the following issues. ***Because most of these issues are in their infancy, any one of them could become an ARC opportunity through research efforts, regional visioning, and/or coordination of planning.***

1. Single-Sector Policies and Programs

a. Increasing availability of and access to renewable energy and energy efficiency technologies
b. Conversion of animal waste into energy
c. Examination of coal bed methane potential
d. Green building incentives
e. Energy workforce development

2. Cross-Cutting Policies and Programs

a. Comprehensive transportation plans and policies, including state fleet requirements
b. Energy education
c. Air and water quality improvement plans and policies
d. Incentives for innovative technology research and development
e. Climate change policies, including reduction of greenhouse gases and planning for possible carbon emissions regulations and/or possible greenhouse marketplace

[41] Background Document. EPA Clean Energy-Environment Technical Forum, Feb. 28, 2005. www.keystone.org
[42] Georgia - http://www.georgiaenergyplan.org/
Kentucky - http://www.energy.ky.gov/NR/rdonlyres/8E6F3FFE-5DC6-4FC6-9B5A-EA9D2AC89E7A/0/KentuckyEnergyPlan.pdf
New York - http://www.nyserda.org/Energy_Information/energy_state_plan.asp
North Carolina - http://www.energync.net/sep/docs/sep_12-04.pdf
Pennsylvania - http://jsg.legis.state.pa.us/ENERGY_2.PDF
Tennessee - http://www.state.tn.us/ecd/pdf/energy/energy_policy.pdf
Virginia - http://www.mme.state.va.us/De/chap2b.html
West Virginia - http://www.wvenergyroadmapworkshops.org/reports/WestVirginiaEnergyRoadmap08-20-02.pdf

- In addition to, or in lieu of, including climate change in statewide energy plans, seven Appalachian states have completed Climate Action Plans to outline specific policies to address climate concerns.

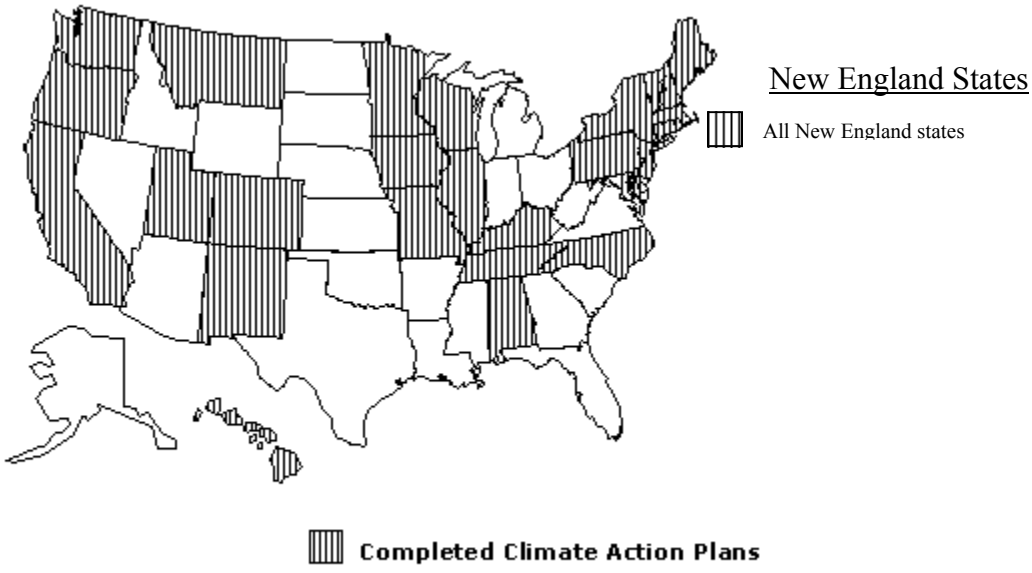
3. Other Leading State Policies

A key feature of **California**'s Energy Action Plan II is the "loading order" that describes the priority sequence for adding energy resources in the state. The loading order indicates a preference for cost-effective energy efficiency and demand response, followed by renewable power sources and distributed generation, such as combined heat and power applications. To the extent that these resources fall short of meeting demand, the state supports clean, efficient, fossil fuel-fired generation.

D. Climate Change

1. Greenhouse Gas Emissions Reductions

New Mexico has set targets for greenhouse gas emissions reductions.[43] The targets include achieving 2000 emissions level in 2012, 10% less than 2000 levels in 2020, and 75% less than 2000 levels by 2050. New Mexico is the first state that is a major producer of coal, oil, and gas to state targets for reducing greenhouse gas emissions. **California** is also setting aggressive reduction targets, aiming to achieve 2000 emissions levels by 2010 and 1990 levels by 2020.[44]



Adapted from Pew Center on Global Climate Change

[43] Climate Change and Greenhouse Gas Reduction. New Mexico Executive Order 05-33. http://www.governor.state.nm.us/orders/2005/EO_2005_033.pdf
[44] Assembly Bill 1493. http://www.arb.ca.gov/cc/ab1493.pdf

2. **Climate Change and Agriculture**

Nebraska has created and funded the Carbon Sequestration Advisory Committee to address issues of carbon sequestration and agriculture in the state.[45] The Committee members represent agriculture, energy, and state government, and its work has helped to identify the next steps in implementing a state policy for carbon sequestration. There is evidence that agricultural lands have great potential to store carbon. The **Illinois** Conservation and Climate Initiative is already implementing a voluntary program that offers credits to farmers for their efforts to reduce greenhouse gas emissions.[46] Such efforts may include conservation tillage, planting grasses and trees, and capturing methane from animal operations. Earned credits will be sold to the Chicago Climate Exchange, which is a market for trading greenhouse gas emission credits.

3. **Climate Change and Transportation**

California has led the way and been joined by nine other states that propose to regulate greenhouse gas emissions from vehicles. Currently under challenge in the courts, the legislation requires the state to develop and adopt regulations that achieve the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks. The California regulations were issued in 2004 and require new vehicles in 2012 to emit 22 percent less carbon dioxide than today's vehicles. Greenhouse gas reductions of up to 30 percent would be required by 2016.

California also recently passed legislation that would set aside 75,000 permits for drivers of hybrids that get at least 45 miles per gallon to drive alone in carpool lanes.

E. Regional Planning Initiatives

1. **West Coast Governors' Global Warming Initiative**

The three states on the West Coast (California, Oregon, and Washington) are collaborating to reduce greenhouse gas emissions through the West Coast Governors' Global Warming Initiative.[47]

2. **Clean and Diversified Energy Initiative**

The 18 western states that comprise the Western Governors' Association (WGA) have created a Clean and Diversified Energy Initiative to investigate strategies to increase efficiency and renewable energy sources in western electricity systems. There are 8 technical task forces that have been exploring new strategies for advanced coal, biomass, energy efficiency, geothermal, solar, transmission, and wind.[48]

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[45] "Greenhouse and Statehouse: The Evolving State Government Role in Climate Change." Barry G. Rabe, Pew Center on Global Climate Change. November 2002. http://www.pewclimate.org/global-warming-in-depth/all_reports/greenhouse_and_statehouse_/index.cfm

[46] http://www.iges.or.jp/en/cp/pdf/activity06/23.pdf

[47] http://www.ef.org/westcoastclimate/

[48] Western Governors' Association. "Clean Energy, a Strong Economy and a Healthy Environment." Report of the Clean and Diversified Energy Advisory Committee to the Western Governors. June 2006. http://www.westgov.org/wga/initiatives/cdeac/CDEAC06.pdf

3. **Powering the Plains**
   Powering the Plains is a project seeking to craft alternative energy strategies, policies, and demonstration projects for Minnesota, Iowa, Wisconsin, the Dakotas, and Manitoba Province (in Canada). Agricultural practices that minimize climate impacts are also addressed.[49]

4. **Southwest Climate Change Initiative**
   The Southwest Climate Change Initiative is a partnership between the governors of Arizona and New Mexico to work together to reduce greenhouse gas emissions and address other aspects of climate change in the southwest.[50]

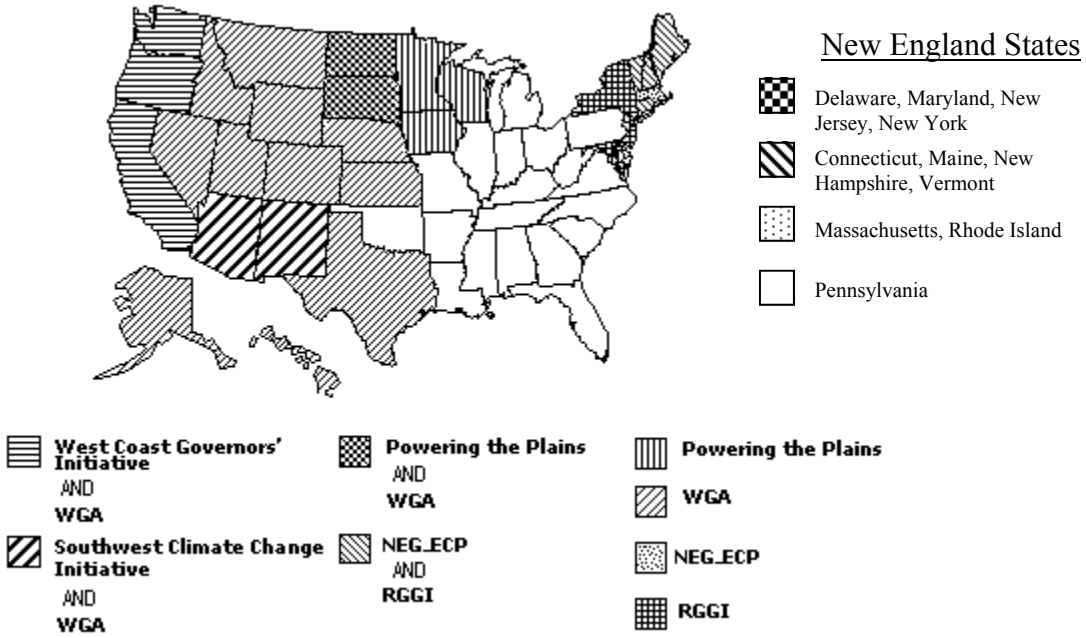
5. **Regional Greenhouse Gas Initiative (RGGI)**
   RGGI is an agreement among seven northeastern and mid-Atlantic states. It is a cap-and-trade system that addresses carbon dioxide emissions from regional power plants. RGGI offers flexibility in terms of mechanisms for achieving reductions targets, including credits for emissions reductions achieved outside the electricity sector.[51]

6. **Eastern Climate Registry**
   RGGI states have partnered with Pennsylvania, Massachusetts, and Rhode Island to develop a regional greenhouse gas registry.[52]

7. **Northwest Power and Conservation Council (NPCC)**
   Created by Congress in 1980 because of the Federal Power System in the Northwest, the NPCC includes two representatives from each state. The Council is developing a 20-year electric power plan for reliable energy at the lowest economic and environmental cost. The energy plan gives highest priority to cost-effective conservation, followed by renewable resources, to the extent they are cost-effective. The current plan (5th Plan) includes specific targets and action items for conservation, demand response, and wind resources.[53]

8. **Conference of New England Governors and Eastern Canadian Premiers (NEG/ECP)**
   Created in 1973, the Conference of New Governors and Eastern Canadian Premiers is an international association of leaders cooperating to advance the interests of participating states and provinces through collaboration with the private sector. The Conference has addressed environmental protection, economic development, tourism, energy, fisheries, trade, and agriculture. The participating U.S. states are Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.

[49] http://www.gpisd.net/resource.html?Id=61
[50] http://www.governor.state.az.us/press/2006/0602/022806_SouthwestClimateChangeInitiative.pdf
[51] http://www.rggi.org/about.htm
[52] http://www.easternclimateregistry.org/
[53] EPA, Clean Energy-Environment Guide to Action for States.
www.epa.gov/cleanrgy/stateandlocal/guidetoaction.htm



Adapted from Pew Center on Global Climate Change

Possible Planning Opportunities for ARC
Host meeting or series of calls for Appalachian states to learn from non-Appalachian leaders in energy policy about integrating state actions at the regional level
Initiate regional climate action planning for Appalachia

Appendix A: Relevant State Policy References and Resources

Alabama	"Alabama Tax Incentives for Industry." http://www.ador.state.al.us/Taxincentives/IncentivesForIndustry.pdf
Kentucky	Kentucky Revised Statutes http://www.lrc.ky.gov/krs/titles.htm
Maryland	Maryland-Mined Coal Tax Credit http://business.marylandtaxes.com/taxinfo/taxcredit/coal/default.asp
New York	Advanced Clean Coal Power Plant Initiative http://www.gorr.state.ny.us/ACCPPI-welcome.html
Ohio	"Ohio Coal Development Agenda" http://www.ohioairquality.org/ocdo/coaldevagenda.asp
Pennsylvania	"Effects of Global Warming on the State of Pennsylvania" http://www.rprogress.org/e2/e2_pennsylvania.pdf
Virginia	Virginia Tax Policy Library http://www.policylibrary.tax.virginia.gov/OTP/Policy.nsf
Multiple States: Oil and Gas	"2005 Investments in Energy Security: State Incentive Security." http://www.iogcc.state.ok.us/PDFS/2005-Investments-in-Energy-Security-State-Incentives.pdf
Multiple States: EE / RE	Database of State Incentives for Renewable Energy. http://www.dsireusa.org/ Pew Center on Global Climate Change. "Learning from State Action on Climate Change." June 2006 Update. http://www.pewclimate.org/policy_center/policy_reports_and_analysis/state/index.cfm Pew Center on Global Climate Change. "State Action Maps." http://www.pewclimate.org/what_s_being_done/in_the_states/state_action_maps.cfm Rabe, Barry G. "Greenhouse and Statehouse: The Evolving State Government Role in Climate Change." Pew Center on Global Climate Change. November 2002. http://www.pewclimate.org/global-warming-in-depth/all_reports/greenhouse_and_statehouse_/index.cfm U.S. Department of Energy. "Federal and State Incentives." http://www.eere.energy.gov/afdc/laws/incen_laws.html U.S. Environmental Protection Agency. *Clean Energy-Environment Guide to Action*. 2006. http://www.epa.gov/cleanrgy/stateandlocal/guidetoaction.htm

Appendix B: Appalachian Energy Policies (State–by-State)

APPALACHIAN ENERGY POLICIES (STATE-BY-STATE)

			States	Alabama	Georgia	Kentucky	Maryland	Mississippi	New York	North Carolina	Ohio	Pennsylvania	South Carolina	Tennessee	Virginia	West Virginia
PLANS			Climate Action Plan	X		X	X		X	X		X		X		
			Statewide Energy Plan		X	X			X	X				X	X	X
		-														
DEMAND-SIDE POLICIES AND PROGRAMS		Other			f	a, f	a	b, c	d	a, e	c	c, e, f			c	c, e
		-	-													
	Energy Efficiency		Output-Based Regulation				X		X		X					
			Energy Codes (Residential and/or Business)		X	X			X	X	X	X	X	X	X	X
			Green Building Standards				X		X			X				
			Appliance Efficiency Standards				X		X							
			Investment Incentives for Energy Efficiency Technologies	X	X				X	X	X	X	X	X		X
	Renewable Energy		Green Pricing	X	X	X		X		X	X		X	X		
			Alternative Fuel and Alternative Fuel Vehicle Incentives and/or Requirements		X	X	X	X	X	X	X	X	X	X	X	X
			Green Power Purchasing Requirements				X		X			X	X			
			Net Metering Rules		X	X	X		X	X	X	X			X	
			Interconnection Standards		X		X		X	X	X	X			X	
			Production Incentives		X		X	X	X	X	X	X		X		
			Investment Incentives	X		X	X	X	X		X	X	X		X	X
SUPPLY-SIDE POLICIES AND PROGRAMS	Alternative Fuels		Production Incentives for Biofuels			X	X	X					X		X	
		-														
	Natural Gas and Oil		Streamlined Permitting and/or Reporting								X	X				
			Enhanced Oil Recovery Incentives	X				X							X	
			Production Incentives for Oil	X		X			X							X
			Production Incentives for Natural Gas	X					X			X			X	X
	Electricity															
			Generation Disclosure Requirements				X		X		X	X			X	
			Energy Efficiency Resource Standards									X				
			Resource Portfolio Standards				X		X			X				
			Demand Response	X	X	X	X		X	X	X	X	X		X	X
			Systems Benefits Fund						X		X	X				
		-														
	Coal		Tax Credits for New Clean Coal Facilities			X			X		X	X				
			Indigenous Coal Use Incentives			X	X								X	
			Production Incentives	X											X	

Other Policies
a. Renewable easements for access to resource
b. Renewable or efficiency construction policies for government buildings
c. Solar and/or wind access law
d. Efficiency equipment leasing provisions
e. Industry recruitment incentives
f. Incentives for new technologies

Appendix C: National & State Energy Trends, Challenges and ARC Opportunities

	Barriers/Challenges	Possible ARC Opportunities
Coal	1. Clean coal technologies hold promise for increasing use of Appalachian coal for energy production. However, there is concern about the difficulty of permitting clean coal facilities, such as those using integrated gas combined cycle (IGCC) and carbon capture and sequestration (CCS) technologies. 2. Capital costs for IGCC facilities are substantial. 3. 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.	1. In order to facilitate future permitting of IGCC and CCS plants, states need more information about these technologies. ARC could invite state regulators to participate in a roundtable discussion of how to streamline the permitting process for IGCC and CCS facilities. 2. ARC could serve as a broker for funding for IGCC facilities in Appalachian states. 3. Strong regulatory oversight of production and use of energy, particularly its environmental impacts, will be important in safeguarding the public's interest. ARC could work to identify and encourage best practices among Appalachian states, particularly in establishing new regulatory frameworks for CO_2 storage.
Oil & Gas	1. 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.	1. 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.
Electricity	2. As is indicated above, several states have expressed an interest in pursuing systems benefit funds and renewable portfolio standards. Documents prepared by these states suggest that state officials want to assess the feasibility of these policies and study their potential impacts to the economy and the environment.. 3. Some states in Appalachia are experiencing electricity supply problems. Others are concerned about minimizing risk of supply disruptions in the future.	1. ARC could provide research or assessment funds to assist in determining the costs/benefits of RPS and SBF policies. 2. ARC could host conference calls or discussion groups in which states who currently have systems benefits funds and/or renewable portfolio standards could share their knowledge and experience with other states. 3. ARC could initiate and/or host a regional energy compact and regional planning for energy supply/infrastructure redundancies.

Biofuels	Several states would like to increase production and on-road delivery of biofuels. 3. Coordination of production and delivery across states could minimize harmful duplication or omission of services and service areas. 4. Increased demand for biofuels would make expansion of production and delivery of biofuels more feasible.	ARC could: 1. Help coordinate planning of biofuels production and delivery across Appalachia by hosting a database of planned and implemented projects. 2. Help states coordinate efforts to attract facilities that produce alternative fuel vehicles that run on biodiesel.
RE / EE	i. Regional planning and implementation of renewable energy and energy efficiency policies and programs is disjointed. ii. Creating demand for RE and EE technologies is a critical factor in growing this sector.	1. ARC could coordinate regional planning of RE and EE policies by hosting a database, meetings, and/or conference calls. 2. ARC could host discussions about regional criteria for green building standards.. 3. ARC can provide information to utilities and state agencies to tailor their energy-saving programs to take advantage of and complement new federal tax incentives.

Possible Planning Opportunities for ARC

- Host meeting or series of calls for Appalachian states to learn from non-Appalachian leaders in energy policy
- Initiate regional energy and/or climate action policy for Appalachia

Additional Issue Areas / Possible Opportunities for ARC

Single-sector policies and programs

- Increasing availability of and access to renewable energy and energy efficiency technologies
- Conversion of animal waste into energy
- Examination of coal-bed methane potential
- Green building incentives
- Energy workforce development

Cross-cutting policies and programs

- Comprehensive transportation plans and policies, including state fleet requirements
- Energy education
- Air and water quality improvement plans and policies
- Incentives for innovative technology research and development
- Tracking policy and program developments at the federal level. Disseminating information to states.

Appendix D: Western Governors' Association
Policy Resolution 06-10
June 11, 2006
Sedona, Arizona

Clean and Diversified Energy for the West

A. BACKGROUND

1. Traditional resources such as oil, natural gas, coal and hydropower have played and will continue to play a significant role in meeting future energy needs. At the same time, resources such as energy efficiency, solar, wind, geothermal, biomass and advanced coal technologies are relatively untapped but hugely promising. Together, the combination of these resources provides the foundation for a clean, diversified and secure energy future for the West.

2. The Western Governors' Association launched its Clean and Diversified Energy Initiative in a June 2004 resolution (*04-13*) that set out the objective of "identifying ways to increase the contribution of renewable energy, energy efficiency, and clean energy technologies within the context of the overall energy needs of the West." This resolution identified the need for new clean and diversified energy sources for transportation, buildings, electricity, and other needs, and outlined four important goals:

    i. additional development of 30,000 megawatts of clean energy by 2015 from resources such as energy efficiency, solar, wind, geothermal, biomass, clean coal technologies, and advanced natural gas technologies;
    ii. a 20% increase in energy efficiency by 2020;
    iii. an ability to meet the transmission needs of the West for the next 25 years; and
    iv. better position the Western energy system to respond to new environmental challenges, including potential limitations on emissions.

3. The Western Governors' Association recognizes that a clean and diversified energy system will:
    - Protect the Western economy from energy shortages and price spikes that are harmful to businesses and consumers and disruptive to investment;
    - Augment our pursuit of a national energy policy that will result in a diverse energy portfolio;
    - Accommodate the energy needs of a growing, mobile Western population;
    - Better position the Western energy system to respond to new local, regional and environmental challenges; and
    - Take advantage of the development of new technologies that will lower the cost of renewable energy and reduce the cost of controlling emissions from the West's vast fossil fuel resource base.

4. Western states have a variety of energy efficiency and clean energy policies and programs in place. For example, eight states have established renewable energy standards, twice the number in place when the resolution launching the Clean and Diversified Energy Initiative was passed. Nine states manage funds to promote energy efficiency.

5. Western Governors agreed to collaborate and offer their support for regional and subregional initiatives being undertaken among Western states to:
    i. Improve the balance and overall adequacy of all energy resources in a manner which will strengthen economic growth, promote energy price stability, mitigate environmental impact, maximize reliability and result in an abundance of diversified resource supplies; and
    ii. Promote the integration of traditional and new energy resource technologies.

6. The Western Governors' Association formed the Clean and Diversified Energy Advisory Committee (CDEAC) to identify technically and financially viable policy mechanisms, stressing non-mandatory, incentive-based approaches, to meet the goals. In turn, the CDEAC created a series of task forces to specifically consider options related to solar, wind, biomass, geothermal, advanced coal, advanced natural gas, energy efficiency and transmission.

7. The CDEAC and the technology task forces met over the intervening period to:
    - Review and consider the feasibility of the clean and diversified energy goals;
    - Examine the deliverability and adequacy of energy resources, including an assessment of promising new resources and technologies;
    - Examine the obstacles to both intrastate and interstate transmission siting and construction in order to access clean energy resources;
    - Consider price, reliability, and the mitigation of environmental impacts of all recommendations;
    - Develop energy efficiency recommendations that take into account all types of energy used in buildings, not just electricity; and
    - Address both technical and policy issues.

8. The CDEAC submitted its report to the Western Governors in May, 2006 with a series of recommendations designed to meet the goals of the governors' initiative. The CDEAC report identified strategies and policy options for resources such as solar, wind, geothermal, biomass, advanced coal technologies, and advanced natural gas technologies that can far exceed the target of 30,000 MW by 2015. It also identified cost-effective energy efficiency that can reduce annual load growth in the West from around 2% to 0.5% while saving customers and businesses billions of dollars a year.

B. GOVERNORS' POLICY STATEMENT

1. The Western Governors acknowledge and recognize the positive contribution of more than 250 CDEAC process participants who dedicated time, resources and energy to this comprehensive project, as well as those who provided financial support. The CDEAC's work has been productive, collaborative and influential. The Western Governors accept the CDEAC report with commendation to the many individuals, organizations and staff that made it a success.

2. Western Governors agree to draw upon the full range of recommendations contained in the CDEAC report as a basis on which to advocate for energy policy changes at the federal and regional levels and their respective states, where appropriate.

3. Western Governors are supportive of federal energy polices that:
   - Provide for a long-term (10 year) extension of the production tax credit for all renewable energy technologies, with complementary polices for consumerowned utilities and tribes;
   - Provide tax credits for energy efficiency investments
   - Raise the cap on the residential investment tax credit to $10,000 for renewable energy or distributed generation systems;
   - Support improvements in national appliance efficiency standards;
   - Encourage adequate funding for state programs, including energy efficiency, clean generation and storage technology research, development and demonstration;
   - Encourage federal agencies to collaborate with Western states and regional organizations on facility siting and infrastructure planning, consistent with sound, sustainable environmental practices;
   - Extend the federal IGCC tax credit for five years and provide a tax credit program for carbon capture and sequestration for at least five years;
   - Support increased federal support and tax incentives for the construction of multiple pilot facilities that demonstrate IGCC, in the Western United States in high altitude areas using western coal; and
   - Encourage proactive, transparent, stakeholder-driven regional transmission expansion planning, defer to existing regional and sub-regional processes that meet such standards, and reform imbalance penalties to allow for greater use of the existing transmission system.

4. Western Governors find that a strong and resilient transmission and distribution grid is critical to electricity affordability and reliability. Grid expansion must also be undertaken in an environmentally responsible manner. We encourage regulators, policymakers, utilities, transmission operators and other stakeholders to consider the recommendations identified within the CDEAC report in order to eliminate barriers to greater utilization of clean energy resources across the west.

5. Western Governors agree to collaborate in advancing regional and sub-regional policies for major interstate clean energy projects and programs, and to promote implementation of the Western Regional Energy Generation Information System to facilitate development of regional markets

6. Western Governors support reforms in the U.S. Federal Energy Regulatory Commission's Open Access Transmission Tariff to implement the recommendations of the CDEAC that promote (a) regional transmission planning expansion and (b) expanded use of the existing transmission grid by reforming imbalance penalties.

7. Western Governors recognize that a combination of state, regional and federal policy action will be required to advance a clean and diversified energy system and deliver the reliability, cost and environmental benefits to Western energy consumers. Accordingly, Western Governors support the promotion and distribution of the CDEAC report in advancing such action.

C. GOVERNORS' MANAGEMENT DIRECTIVE

1. The Western Governors direct the WGA staff to work toward federal adoption of the policies supported in this resolution. The adoption and implementation of clean energy policies remains a high priority for Western states.

2. The Western Governors' Association will assist, as available and appropriate, with the development of regional or interstate policies and projects that are consistent with this resolution.

3. The Western Governors direct the WGA staff to consider options to ensure continued broad stakeholder involvement into energy policy discussions regarding energy efficiency and conservation, supply and energy use, including the development of funding mechanisms to continue the work.

4. The Western Governors direct Western Governors' Association to identify mechanisms to assist the Governors in enacting policies that achieve clean and diversified energy goals and report back to the governors not later than the winter 2006 meeting. These mechanisms should include:
    - Act as a clearinghouse by collecting and disseminating information on adopted policies and programs;
    - Measurement and reporting of progress against energy efficiency and clean energy generation goals; and
    - Regularly collaborate with existing regional policy organizations, WGA affiliates such as the Western Interstate Energy Board, the Western Regional
    - Air Partnership, and other entities to develop and implement regional clean energy policies.

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