www.arclimatechange.us/

Energy Supply (ES) Technical Work Group

Summary List of Pending Priority Policy Options for Analysis

	Policy Option	GHG Reductions ($MMtCO_2e$)			Net Present Value 2009–2025 (Million $)	Cost-Effectiveness ($/tCO_2e$)	Level of Support
		2015	2025	Total 2009–2025			
ES-1	Green Power Purchases and Marketing	*Not Yet Quantified*					Pending
ES-2	Technology Research & Development	*Not Yet Quantified*					Pending
ES-3	Renewable and/or Environmental Portfolio Standard (RPS/EPS)	*Not Yet Quantified*					Pending
ES-4	Grid-Based Renewable Energy Incentives and/or Barrier Removal	*Not Yet Quantified*					Pending
ES-5	Approaches Benefiting From Regional Application	*Not Yet Quantified*					Pending
ES-6	Combined Heat and Power	*Not Yet Quantified*					Pending
ES-7	Geological Underground Sequestration for New Plants	*Not Yet Quantified*					Pending
ES-8	Transmission System Upgrades	*Not Yet Quantified*					Pending
ES-9	Nuclear Power	*Not Yet Quantified*					Pending
ES-10	Carbon Tax	*Not Yet Quantified*					Pending
ES-11	Efficiency Improvements and Repowering of Existing Plants	*Not Yet Quantified*					Pending

GHG = greenhouse gas; $MMtCO_2e$ = million metric tons of carbon dioxide equivalent; $/tCO_2e$ = dollars per metric ton of carbon dioxide equivalent.

Note: The numbering used to denote the pending priority draft policy options is for reference purposes only; it does not reflect prioritization among these important draft policy options.

ES-1. Green Power Purchases and Marketing

Policy Description

[The ES TWG recommends that this option be dropped from the ES TWG list of policy options because it overlaps too much with RCI-7, where it is more appropriately located.]

Green power purchasing refers to a variety of consumer-driven strategies to increase the production and delivery of low-greenhouse gas (GHG) power sources, beyond levels achieved through renewable portfolio standards and other mandatory programs. These strategies provide consumers with information about alternative green power sources they can select, rather than the traditional, more carbon-intensive source.

This policy should establish an Arkansas Green Power consortium, with participation from a variety of groups, including the electric utilities, in-state renewable energy producers, the Arkansas Department of Economic Development, and state universities' technology wings. In addition, it should:

- Work to develop renewable energy production facilities in the state.
- Publicize, communicate, and market green power to consumers with a voluntary Arkansas Green Power fund.
- Establish a revolving loan pool to assist in the start-up costs for the program and reinvest the dollars in new and emerging technologies involving green power.

Policy Design

Goals: Electric facilities purchase green power to cover [x] % of their power needs by [year]. Implement programs to provide consumers the option to purchase green power.

Timing: Consumers participate in green power purchasing by [year].

Implementing Parties: State facilities, electric utilities, renewable energy producers, electricity consumers, and buyers of energy-using appliances and equipment.

Other: TBD – [as needed and approved by the TWG]

Implementation Mechanisms

TBD – [as approved by the TWG]

Related Policies/Programs in Place

A 2007 survey of residential consumers in Arkansas revealed 44% of consumers would be willing to pay more for electricity produced from renewable resources. While this survey was exclusively from electric cooperative members, the data could reasonably be expected to apply to all Arkansas consumers. Based on this information, a comprehensive marketing and

communications strategy was developed, and the Electric Cooperatives of Arkansas (ECA) Green Power voluntary program was launched in March 2008. Consumers can voluntarily purchase 100 kilowatt-hour (kWh) blocks of electricity at $0.05 per kWh, or $5.00 per block. ECA will escrow 100% of the funds and use the accumulated resources to build, acquire, or otherwise provide energy produced by new renewable resources to supplement the existing hydroelectric generation (average annual hydro production exceeds 500,000 megawatt-hours [MWh]). Alternatively, the funds may be used to invest in energy efficiency efforts.

Despite an aggressive marketing campaign (including print, magazine, radio, bill stuffers, Internet marketing, direct mail, and special-event marketing), response to the program has been less than enthusiastic. However, the program is only 2 months old.

ECA's experience is consistent with most electric utilities that have introduced consumer-driven green power programs. One of the more successful programs in the United States, the North Carolina Green Power program, has been marketing renewables for over 2 years and has not passed the 1% participation rate.

Encouraging a higher participation level may be achieved by linking the development of renewable resources with economic development and more effective promotion.

Type(s) of GHG Reductions

TBD – [as approved by the TWG]

Estimated GHG Reductions and Costs or Cost Savings

TBD – [as approved by the TWG]

Data Sources: [TBD, as approved by the TWG]

Quantification Methods: [e.g., Full life-cycle analysis with supply/demand equilibrium adjustments on TWG approval]

Key Assumptions: [TBD, as approved by the TWG]

Key Uncertainties

TBD – [as needed and approved by the TWG]

Additional Benefits and Costs

TBD – [as needed and approved by the TWG]

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #7 or #8]

Level of Group Support

TBD – [blank until GCGW meeting #7 or #8]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

ES-2. Technology Research & Development

Policy Description

Research and Development (R&D) funding can be targeted toward a particular technology or group of technologies as part of a state initiative to build an industry around that technology in the state, and/or to set the stage for adoption of the technology for use in the state. For example, an agency can be established with a mission to help develop and deploy energy storage technologies. R&D funding can also be made available to any renewable or other advanced technology through an open bidding procedure (i.e., driven by bids received, rather than by a focused strategy to develop a particular technology). Funding can also be provided for demonstration projects to help commercialize technologies that have already been developed, but that are not yet in widespread use. Finally, funding can be targeted to increase collaboration among existing institutions in the state for R&D.

States can undertake initiatives focused on developing, promoting, and/or implementing one or more specific fossil fuel or nuclear technologies that show promise for reducing GHG emissions. Technologies could include carbon capture and storage (to sequester carbon dioxide (CO_2) emissions from power plants, oil and gas operations, and/or refineries); biomass blending in coal power plants; and implementation of equipment in oil and gas operations that increase efficiency and reduces losses (e.g., remote sensors of leaks).

Mechanisms to encourage CO_2 capture and storage or reuse (CCSR) could include a state agency or department within an existing agency tasked with promoting CCSR, evaluation studies to identify geologically sound reservoirs, R&D funding to improve CCSR technologies, and/or financial incentives or mandates to capture and store carbon or to capture and reuse it.

Policy Design

Goals: The goals of this policy may be non-quantifiable. They would include:

- Identify the likely funding mechanisms and policy tools that would provide further stimulus for the development of new, reasonable cost, low- and zero-GHG-emitting electricity generation in Iowa.
- Complete a detailed evaluation study for [specific alternative] energy potential in Arkansas.
- Complete at least one high-visibility R&D demonstration to showcase alternative energies.

Timing: Establish funding in the [year] legislative session. Finish study in [year]. Issue first request for proposals [month, year].

Parties Involved: State government, private and public partners on a voluntary basis.

Other: TBD – [as needed and approved by the TWG]

Implementation Mechanisms

Use of existing regulatory authority to address relevant issues, such as pricing.

Related Policies/Programs in Place

TBD – [as needed and approved by the TWG]

Type(s) of GHG Reductions

TBD – [as approved by the TWG]

Estimated GHG Reductions and Costs or Cost Savings

TBD – [as approved by the TWG]

Data Sources: [TBD, as approved by the TWG]

Quantification Methods: [e.g., Full life-cycle analysis with supply/demand equilibrium adjustments on TWG approval]

Key Assumptions: [TBD, as approved by the TWG]

Key Uncertainties

TBD – [as needed and approved by the TWG]

Additional Benefits and Costs

TBD – [as needed and approved by the TWG]

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #7 or #8]

Level of Group Support

TBD – [blank until GCGW meeting #7 or #8]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

ES-3A. Renewable Portfolio Standard (RPS)
ES-3B. "REFIT"

Policy Description

3A. A renewable portfolio standard (RPS) is a requirement that utilities must supply a certain, generally fixed percentage of electricity from an eligible renewable energy source(s). An environmental portfolio standard (EPS) expands that notion to include energy efficiency or other GHG emission-reducing technologies as an eligible resource. About 20 states currently have an RPS in place, while a handful have implemented an EPS. In some cases, utilities can also meet their portfolio requirements by purchasing renewable energy certificates (REC) from eligible renewable energy projects. Because the Residential, Commercial, and Industrial (RCI) Technical Working Group (TWG) is including utility-managed end-use efficiency as one of its priority options, we will not consider energy efficiency here, leaving us with only an RPS to consider.

3B. In addition to an RPS, we recommend an incentive-based approach, best described as "renewable electricity based on feed-in tariffs" (REFIT), which is likely to be both more effective than an RPS in increasing Arkansas' use of renewable energy, and more acceptable to utilities. Some observers argue that Arkansas has significant amounts of such electricity-producing, non-hydro renewable energy resources as wind, photovoltaic (PV), concentrating solar, biomass, or geothermal, while others argue that these resources exist only in insignificant amounts. It is partly for this reason that a mandated RPS is controversial and, for utilities, risky. By avoiding mandates, REFIT avoids these controversies and risks, while maximizing investments in renewable energy sources. This type of program was pioneered by Germany during 1990–2000, and is behind the large growth in wind power in Spain, Germany, and Denmark. These countries now get 9%, 5%, and 20% of their electricity, respectively, from wind, and are beginning to branch out into PV and other solar forms of renewable electricity.

Policy Design

Goals:

3A.

- Meet 15% of its load using renewable energy resources by 2020.

3B.

- Establish a program in Arkansas requiring utilities to offer REFIT incentives to individuals and companies and to pay them at government-set above-market electricity rates for a guaranteed 20-year period, for renewable electricity from approved sources.
- Establish a system of guaranteed financing for such individuals and companies to install approved renewable electricity sources, and to allow utilities to recover the cost of this program (plus a reasonable profit) from their ratepayer base.

Timing: Begins in 2010.

Parties Involved: Investor-owned utilities, electric cooperatives, state government.

Other: None cited.

Implementation Mechanisms

Following is how REFIT works:

Suppose that Jones (who could be an individual or a company), wants to install PV and hopes to generate enough electricity to feed back into the grid. If PV is one of the approved energy sources under the REFIT program, the regional electric utility would be required to purchase Jones' electricity at above-market rates set by the government, and to guarantee this rate for, say, 20 years (the guarantee period in Spain and Germany). The high rate helps overcome the cost disadvantages of renewable energy sources, and may differ among various forms of renewable power generation. In case Jones does not have the capital available to finance the PV installation, he can display this utility guarantee to a financial institute and receive a loan for the purchase price of the installation. (REFIT legislation must guarantee financing for qualified individuals or companies.) The cost to the utility of the above-market electricity rate is borne by ratepayers. For example, if $100,000 worth of renewable electricity is bought in a year by a utility that has 1,000,000 customers, each of those customers will have 10¢ added to their bill annually. To summarize: Jones gets an electricity-purchase incentive from the utility to produce renewable electricity and feed it into the grid, and the utility is reimbursed by ratepayers.

Since Germany, Spain, and Denmark already have considerable experience with REFIT programs, such a program should not take long to establish and could be in operation by perhaps 2012. Because it is difficult to predict how many individuals or firms will want to take advantage of this incentive program, the amount of electricity that might be generated renewably is difficult to predict. The program might be expected to start small and to grow, depending on how viable wind and solar and other renewable forms of electricity turn out to be in Arkansas.

Related Policies/Programs in Place

TBD – [as needed and approved by the TWG]

Type(s) of GHG Reductions

TBD – [as approved by the TWG]

Estimated GHG Reductions and Costs or Cost Savings

TBD – [as approved by the TWG]

Data Sources: [TBD, as approved by the TWG]

Quantification Methods: [e.g., Full life-cycle analysis with supply/demand equilibrium adjustments on TWG approval]

Key Assumptions: [TBD, as approved by the TWG]

Key Uncertainties

TBD – [as needed and approved by the TWG]

Additional Benefits and Costs

TBD – [as needed and approved by the TWG]

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #7 or #8]

Level of Group Support

TBD – [blank until GCGW meeting #7 or #8]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

ES-4. Grid-Based Renewable Energy Incentives and/or Barrier Removal

Policy Description

Arkansas should enact tax incentives and innovative financing programs for residential and commercial utility users who develop or apply successful renewable energy systems. The tax and loan incentives should be proportional to the amount of renewable energy they are using, with the greatest incentives for those who use net metering and return energy to the grid for use by other utility customers. Legislative Council, the Arkansas Department of Finance and Revenue, the Arkansas Development Finance Authority, the Department of Environmental Quality, and the Arkansas Science and Technology Authority, in coordination with the Governor's Commission on Global Warming (GCGW) and the appropriate legislative leaders, should research model programs in other states and countries and make recommendations on specific policies in time for the next legislative session. In addition, pilot and demonstration programs should be established to demonstrate the effectiveness of these policies as they are implemented. Alternative sources of funding, including foundations, utility companies, and others, should be sought to supplement state revenue for these policies.

This policy option reflects financial incentives to encourage investment in renewable energy resources. Examples include: (1) direct subsidies for purchasing/selling renewable technologies; (2) tax credits or exemptions for purchasing renewable technologies; (3) tax credits for each kWh generated from a qualifying renewable facility; (4) regulatory policies that provide incentives and/or assurance of cost recovery for utilities that invest in central station renewable energy systems. In addition, this policy option would make it a priority for the legislature, the Arkansas Public Service Commission (APSC), and other relevant state agencies to identify and rectify barriers that are impeding the development of renewable resources in the state.

Policy Design

Goals: The initial evaluation should include several different types of financial incentives to represent the range of opportunities.

- Offer tax credits or other incentives of $[x] per kW-equivalent for small solar PV, micro-hydro, and small wind up to [x] kW of grid-connected generation.
- Provide a subsidy to renewable energy generators of [x] cent(s)/kWh for electricity generated from a renewable resource, unless that electricity is used to meet a federal, state, or voluntary renewable energy standard.
- Offer low-interest loans for feasible and desirable biomass generation that meets exemplary environmental performance standards, with partial loan forgiveness for equipment that fails to perform to standard.

Timing: Make tax credits and subsidies available beginning in [year] through [year]; make loans available for projects brought online between [year] and [year].

Parties Involved: All power producers operating qualifying facilities for incentives other than tax credits, which would be available to any grid-connected customer.

Other: TBD

Implementation Mechanisms

TBD – [as approved by the TWG]

Related Policies/Programs in Place

TBD – [as needed and approved by the TWG]

Type(s) of GHG Reductions

TBD – [as approved by the TWG]

Estimated GHG Reductions and Costs or Cost Savings

TBD – [as approved by the TWG]

Data Sources: [TBD, as approved by the TWG]

Quantification Methods: [e.g., Full life-cycle analysis with supply/demand equilibrium adjustments on TWG approval]

Key Assumptions: [TBD, as approved by the TWG]

Key Uncertainties

TBD – [as needed and approved by the TWG]

Additional Benefits and Costs

TBD – [as needed and approved by the TWG]

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #7 or #8]

Level of Group Support

TBD – [blank until GCGW meeting #7 or #8]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

ES-5. Approaches Benefiting From Regional Application

Policy Description

The primary goal of this policy option is to establish a program that will allow Arkansas to adapt to and be prepared for a federally implemented cap-and-trade system. This system is a market mechanism by which GHG emissions are limited or capped at a specified level, and participants in the system are required to hold permits for each unit of their emissions. Through trading, participants with lower costs of compliance can choose to reduce their emissions beyond the limit, and sell their additional reductions to participants for whom compliance costs are higher. In this fashion, overall costs of compliance are lower than they would otherwise be.

Policy Design

Goals: Not quantifiable

Timing:

Parties Involved:

Other: TBD – [as needed and approved by the TWG]

Implementation Mechanisms

TBD – [as approved by the TWG]

Related Policies/Programs in Place

TBD – [as needed and approved by the TWG]

Type(s) of GHG Reductions

TBD – [as approved by the TWG]

Estimated GHG Reductions and Costs or Cost Savings

TBD – [as approved by the TWG]

Data Sources: [TBD, as approved by the TWG]

Quantification Methods: [e.g., Full life-cycle analysis with supply/demand equilibrium adjustments on TWG approval]

Key Assumptions: [TBD, as approved by the TWG]

Key Uncertainties

TBD – [as needed and approved by the TWG]

Additional Benefits and Costs

TBD – [as needed and approved by the TWG]

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #7 or #8]

Level of Group Support

TBD – [blank until GCGW meeting #7 or #8]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

ES-6. Combined Heat and Power

Policy Description

Combined heat and power (CHP) refers to any system that simultaneously or sequentially generates electric energy and utilizes the thermal energy that is normally wasted. The recovered thermal energy can be used for industrial process steam, space and water heating, air conditioning, water cooling, product drying, or nearly any other thermal energy need in the commercial and industrial sector. The end result is significantly increased efficiency over generating electric and thermal energy separately. In fact, many CHP systems are capable of an overall efficiency of over 80%—double that of conventional systems. Another significant advantage is the reduced transmission and distribution (T&D) losses associated with centralized power generation.

Policy Design

Reports from the U.S. Department of Energy's Energy Information Administration (EIA) show 16 distributed generation units in Arkansas with a 1–20 MW capacity, with a combined capacity of 126 MW. Annual energy production from these facilities exceeds 785 gigawatt-hours, equivalent to less than 2% of retail energy sales. Though no assessment of the thermal efficiency is available, the units operate at a relatively high capacity factor, exceeding 70%. According to an assessment by Electric Power Research Institute, the market adoption of CHP has been limited due to a confluence of barriers, including a lack of compelling savings and economics for end users and lack of high enough margins for utility or third-party business models.

The combination of higher natural gas prices, potential increased cost of all fuel-based energy production due to CO_2 restrictions, impediments to expanding use of coal-based generation, escalating costs for T&D facilities, and dramatic increases in the capital cost for all bulk power supply options will enhance the savings and economics for CHP.

The State should expand on EIA survey data to determine the number of existing distributed generation projects that have CHP potential, assessing the energy reductions achievable with forecasted escalating energy costs.

Goals: Reduce the use of fossil fuel from large industrial sources through a 10% efficiency improvement. This will most likely result in reduced use of natural gas.

Timing: Begins in 2010

Parties Involved: State government and regulators, electric utilities, and renewable energy and CHP industry.

Other: TBD – [as needed and approved by the TWG]

Implementation Mechanisms

TBD – [as approved by the TWG]

Related Policies/Programs in Place

TBD – [as needed and approved by the TWG]

Type(s) of GHG Reductions

TBD – [as approved by the TWG]

Estimated GHG Reductions and Costs or Cost Savings

TBD – [as approved by the TWG]

Data Sources: [TBD, as approved by the TWG]

Quantification Methods: [e.g., Full life-cycle analysis with supply/demand equilibrium adjustments on TWG approval]

Key Assumptions: [TBD, as approved by the TWG]

Key Uncertainties

TBD – [as needed and approved by the TWG]

Additional Benefits and Costs

TBD – [as needed and approved by the TWG]

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #7 or #8]

Level of Group Support

TBD – [blank until GCGW meeting #7 or #8]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

ES-7. Geological Underground Sequestration for New Plants

Policy Description

This policy option refers to the capture of CO_2 from fossil fuel-fired power plant emissions and its sequestration in geologic formations, including oil and gas reservoirs, unminable coal seams, and deep saline reservoirs. Broadly, three different types of technologies exist: post-combustion, pre-combustion, and oxyfuel combustion. After capture, the CO_2 is transported to suitable storage sites, often by pipeline.

In particular, as soon as the technology becomes available after the Plum Point Plant opens, the plant should install and employ post-combustion carbon capture and storage. The Hempstead Plant should not open until it employs, at that time in the future (estimated at 2013–2018) when the technology becomes available, state-of-the-art pre-combustion carbon capture and storage equipment. All other new coal-fired generating plants should employ state-of-the-art pre-combustion carbon capture and storage equipment.

Policy Design

Goals: Capture and store 80%–90% of CO_2 emissions from new power plants.

Timing: Begin achieving reductions in 2018.

Parties Involved: new coal plants in AR

Other: TBD – [as needed and approved by the TWG]

Implementation Mechanisms

TBD – [as approved by the TWG]

Related Policies/Programs in Place

The coal-fired Plum Point Plant is under construction in Arkansas, near Osceola. A second new plant, the Hempstead plant near Texarkana, has been approved by the APSC, but has not yet received its permit from the Arkansas Department of Environmental Quality. Note that the APSC requires cost-effective sequestration technologies when available.

If opened as planned, each plant will emit about 5 million metric tons (MMt) of CO_2 per year. Together, they will add about 16% to Arkansas emissions (62 MMt in 2004).

The large GHG emissions from coal-fired generating plants caused APSC Commissioner David Newbern to dissent from the other two Commissioners' approval of the Hempstead Plant, and to ask "that coal be rejected as the fuel to be used in the construction of any new generating plant unless and until the technology exists, and will be used, to capture and sequester all of the CO_2 emissions" (the quotation is from Newbern's APSC opinion). It is also the stimulus behind a recent bill in the U.S. Congress to place a moratorium on new coal plants until sequestration of the CO_2 emissions from new plants is achieved, and the reason many climate experts, such as the

National Aeronautics and Space Administration's chief climate scientist James Hansen, along with 48 fellow authors of a recent scientific paper on global warming, recommend a similar moratorium on new coal plants.

The charge of the Arkansas GCGW is "to establish a global warming pollutant reduction goal and comprehensive strategic plan." It is difficult to see how the GCGW can achieve this goal if the Plum Point Plant and the Hempstead Plant open as planned.

Type(s) of GHG Reductions

TBD – [as approved by the TWG]

Estimated GHG Reductions and Costs or Cost Savings

TBD – [as approved by the TWG]

Data Sources: [TBD, as approved by the TWG]

Quantification Methods: [e.g., Full life-cycle analysis with supply/demand equilibrium adjustments on TWG approval]

Key Assumptions: [TBD, as approved by the TWG]

Key Uncertainties

TBD – [as needed and approved by the TWG]

Additional Benefits and Costs

TBD – [as needed and approved by the TWG]

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #7 or #8]

Level of Group Support

TBD – [blank until GCGW meeting #7 or #8]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

ES-8. Transmission System Upgrades

Policy Description

Measures to improve transmission systems to reduce bottlenecks and enhance throughput may be required to satisfy long-term electricity demands, improve the efficiency of operations, and allow for delivery of diverse and renewable energy sources located outside of the state. Opportunities may exist to substantially increase transmission line-carrying capacity through the implementation of new construction and retrofit activities on the transmission grid, including incorporating advanced composite conductor technologies, capacitance technologies, and grid management software. Siting new transmission lines can be a difficult process, given their cost and their impacts on the local environment and on the use, enjoyment, and value of property.

Policy Design

A primary goal of this policy option can be to offer incentives to utilities to upgrade existing transmission systems and reduce barriers to siting new transmission lines, to provide access to new energy sources often far from existing transmission lines and load centers.

A second goal can be to reduce T&D line losses. Utilities use a variety of components throughout the T&D system to manage losses. Increasing the efficiency of these components can further reduce losses and associated GHG emissions. For example, Vermont offers a rebate to encourage the installation of energy-efficient transformers. Regulations, incentives, and/or support programs can be applied to achieve greater efficiency of T&D system components.

A third goal can be the general distribution of generation support (interconnection rules, net metering, etc.). Well-designed interconnection rules will ensure that distributed power products meet minimum requirements for performance, safety, and maintenance, at the same time significantly advance the commercialization of these technologies.

Goals: Achieve 5% effective improvement in energy efficiency through reduced T&D system losses.

Timing: Begin phase-in in 2010.

Parties Involved: APSC, investor-owned utilities, generation and transmission electric cooperatives, municipalities, representatives of environmental and economic development organizations, the Federal Energy Regulatory Commission, and transmission owners and operators.

Other: TBD – [as needed and approved by the TWG]

Implementation Mechanisms

TBD – [as approved by the TWG]

Related Policies/Programs in Place

TBD – [as needed and approved by the TWG]

Type(s) of GHG Reductions

TBD – [as approved by the TWG]

Estimated GHG Reductions and Costs or Cost Savings

TBD – [as approved by the TWG]

Data Sources: [TBD, as approved by the TWG]

Quantification Methods: [e.g., Full life-cycle analysis with supply/demand equilibrium adjustments on TWG approval]

Key Assumptions: [TBD, as approved by the TWG]

Key Uncertainties

TBD – [as needed and approved by the TWG]

Additional Benefits and Costs

TBD – [as needed and approved by the TWG]

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #7 or #8]

Level of Group Support

TBD – [blank until GCGW meeting #7 or #8]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

ES-9. Nuclear Power

Policy Description

Nuclear power has historically been a low-GHG source of electric power. However, no new nuclear power plants have come online in the United States since 1996 due to high capital costs. Long-term disposal of nuclear waste and public safety are public policy concerns with nuclear power. With the national pricing of the GHG cost of fossil fuel generation—either a cap-and-trade system or a carbon tax—nuclear power will be more cost-competitive.

The Energy Policy Act of 2005 included provisions encouraging the construction of new nuclear units. There are currently 9 applications for a new plant on file with the Nuclear Regulatory Commission (NRC). The one nearest to Arkansas is adjacent to the existing Grand Gulf unit in Port Gibson, Mississippi; the NRC has accepted it for docketing. As new nuclear power plants come online in the future in the Arkansas region, they will offer Arkansas electric utilities an alternative to the construction of fossil fuel generation units.

Nuclear plant relicensing allows an existing plant to extend the life of the facility for 20 years past its original 40-year license terms. The two existing nuclear units in Arkansas have already completed this process. Thus, no further reductions in current GHG emissions can be achieved through the relicensing process.

Policy Design

Goals: 1 new 1,500-MW nuclear plant operating at 95% capacity factor.

Timing: Operational in 2018.

Parties Involved: APSC.

Other: TBD – [as needed and approved by the TWG]

Implementation Mechanisms

TBD – [as approved by the TWG]

Related Policies/Programs in Place

TBD – [as needed and approved by the TWG]

Type(s) of GHG Reductions

TBD – [as approved by the TWG]

Estimated GHG Reductions and Costs or Cost Savings

TBD – [as approved by the TWG]

Data Sources: [TBD, as approved by the TWG]

Quantification Methods: [e.g., Full life-cycle analysis with supply/demand equilibrium adjustments on TWG approval]

Key Assumptions: [TBD, as approved by the TWG]

Key Uncertainties

TBD – [as needed and approved by the TWG]

Additional Benefits and Costs

TBD – [as needed and approved by the TWG]

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #7 or #8]

Level of Group Support

TBD – [blank until GCGW meeting #7 or #8]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

ES-10. Carbon Tax

Policy Description

A GHG tax would be a tax on each metric ton of CO_2-equivalent emitted from certain sources. The tax could be imposed upstream—based, for example, on the carbon content of fuels (e.g., fossil fuel suppliers)—or at the point of combustion and emission. Although taxed entities would pass some or all of the cost on to consumers, there would be competitive pressure to find cost-effective ways to lower (or offset) emissions. Consumers who see the implicit cost of GHG emissions in products and services could adjust their behavior to lower emissions and reduce cost. The program can be designed to be "revenue neutral" (not a net tax increase), for example, by offsetting with an income tax reduction; can fund policies and programs to assist with reducing GHG emissions; or can be directed to helping the competitiveness of industries or assisting communities affected by the tax.

Arkansas should enact a carbon tax to accomplish the following goals: reduce carbon emissions by making processes that result in such emissions more expensive, creating additional motivation to use alternative methods, processes, and systems; create a revenue stream to help the state pay for some of the transition costs to an economy that is not reliant on carbon-based systems, especially for R&D, tax incentive costs, and other such costs in implementing the GCGW's goals; and reflect the true price to the economy of the long-term damages to the state's environment and economy.

A carbon tax essentially creates a logical way to deal with the costs to the state of global warming, while at the same time providing a larger barrier to the source of the problem in the first place.

Policy Design

Goals:

Timing: Begins in 2010.

Parties Involved: TBD

Other: TBD – [as needed and approved by the TWG]

Implementation Mechanisms

TBD – [as approved by the TWG]

Related Policies/Programs in Place

TBD – [as needed and approved by the TWG]

Type(s) of GHG Reductions

TBD – [as approved by the TWG]

Estimated GHG Reductions and Costs or Cost Savings

TBD – [as approved by the TWG]

Data Sources: [TBD, as approved by the TWG]

Quantification Methods: [e.g., Full life-cycle analysis with supply/demand equilibrium adjustments on TWG approval]

Key Assumptions: [TBD, as approved by the TWG]

Key Uncertainties

TBD – [as needed and approved by the TWG]

Additional Benefits and Costs

TBD – [as needed and approved by the TWG]

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #7 or #8]

Level of Group Support

TBD – [blank until GCGW meeting #7 or #8]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

ES-11. Efficiency Improvements and Repowering of Existing Plants

Policy Description

The generation efficiency of existing plants can be increased through such improvements as installing more efficient boilers and turbines and control systems, applying combined cycle technology, and switching to lower- or zero-emitting fuels at existing plants or new capacity additions. Policies to encourage efficiency improvements and repowering of existing plants could include incentives and/or regulations. Although most economic improvements have already been made, existing power plants should be encouraged to reach specific energy efficiency goals before new plants are constructed.

Policy Design

Goals: Beginning in 2010, power plants should commence efficiency measures by 10%, until the maximum efficiency obtainable is reached.

Timing: Begins in 2010; maximum efficiency realized by 2015.

Parties Involved: Public/consumers, state and local governments, APSC.

Other: TBD – [as needed and approved by the TWG]

Implementation Mechanisms

An estimated cost of carbon should be included to help drive further improvements in efficiency.

Related Policies/Programs in Place

TBD – [as needed and approved by the TWG]

Type(s) of GHG Reductions

TBD – [as approved by the TWG]

Estimated GHG Reductions and Costs or Cost Savings

TBD – [as approved by the TWG]

Data Sources: [TBD, as approved by the TWG]

Quantification Methods: [e.g., Full life-cycle analysis with supply/demand equilibrium adjustments on TWG approval]

Key Assumptions: [TBD, as approved by the TWG]

Key Uncertainties

TBD – [as needed and approved by the TWG]

Additional Benefits and Costs

TBD – [as needed and approved by the TWG]

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #7 or #8]

Level of Group Support

TBD – [blank until GCGW meeting #7 or #8]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]