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**Cross-Cutting Issues (CC)
Technical Work Group**

Summary List of Pending Priority Policy Options for Analysis

	Policy Option	GHG Reductions (MMtCO ₂ e)			Net Present Value 2009–2025 (Million \$)	Cost-Effectiveness (\$/tCO ₂ e)	Level of Support
		2015	2025	Total 2009–2025			
CC-1	Greenhouse Gas Inventories and Forecasts	<i>Not Quantified</i>					Pending
CC-2	State Greenhouse Gas Reporting and Registry	<i>Not Quantified</i>					Pending
CC-3	Statewide Greenhouse Gas Reduction Goals or Targets	<i>Not Quantified</i>					Pending
CC-4	The State's Own Greenhouse Gas Emissions (Lead-by-Example)	<i>Not Quantified</i>					Pending
CC-5	Comprehensive Local Government Climate Action Plans	<i>Not Quantified</i>					Pending
CC-6	State Climate Public Education and Outreach	<i>Not Quantified</i>					Pending
CC-7	Optimizing Best-Scale of Reduction Policies	<i>Not Quantified</i>					Pending
CC-8	Creative Financial Mechanisms	<i>Not Quantified</i>					Pending
CC-9	Adaptation and Vulnerability	<i>Not Quantified</i>					Pending
CC-10	Climate-Change Related Economic Development	<i>Not Quantified</i>					Pending
CC-11	Regulatory Realignment in Government to Encourage Constructive Climate Action	<i>Not Quantified</i>					Pending

GHG = greenhouse gas; MMtCO₂e = million metric tons of carbon dioxide equivalent; \$/tCO₂e = dollars per metric ton of carbon dioxide equivalent.

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

CC-1. Greenhouse Gas Inventories and Forecasts

Policy Description

Greenhouse gas (GHG) emission inventories and forecasts are essential for understanding the magnitude of all emission sources and sinks (both man-made and natural), the relative contribution of various types of emission sources and sinks to total emissions, and the factors that affect trends over time. Inventories and forecasts help to inform state leaders and the public on statewide trends, opportunities for mitigating emissions or enhancing sinks, and verifying GHG reductions associated with implementation of the Governor's Commission on Global Warming's (GCGW's) recommendations to the Governor.

Policy Design

Develop an inventory and forecast system that is aligned with national protocols and tailored to specific emissions/sinks found in Arkansas.

Goals:

1. Coordinate with the U.S. Environmental Protection Agency (EPA) on the development of a mandatory federal GHG reporting rule (see FY2008 Consolidated Appropriations Amendment).¹
 - a. This GHG rule will define sources, thresholds for reporting, and frequency of reporting. The GHG rule can be used to define reporting standards for previous year's emissions.
 - b. The rule will apply to the following gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), sulfur hexafluoride (SF₆).
 - c. Forecasting of GHG emissions will be included as part of the state's responsibilities. In forecasting future GHG emissions, treatment of uncertainties should be transparent, be as consistent as possible across sectors and time, and to the extent possible, reflect multiple scenarios.
2. Gather all inventory related information for all historical years through 1990. Develop a benchmark emissions estimate and associated gap analysis for all years and identify missing data and/or additional information required.

Timing:

1. Implementation of a GHG inventory for previous years shall proceed immediately.
2. Timing of the GHG inventory and forecasting efforts shall be based on the timing of the EPA reporting rule.

¹ 110th US Congress, First Session, H.R. 2764: Consolidated Appropriations Act, 2008, <http://www.govtrack.us/congress/billtext.xpd?bill=h110-2764>, see Title II, Administrative Provisions, U.S. Environmental Protection Agency (EPA) (Including Rescission of Funds), pages 284 and 285.

Parties Involved:

1. Arkansas Department of Environmental Quality
2. Forecast assistance will need to be provided by various other state agencies.

Other:

General Emissions Breakdown

1. Anecdotally, it could be assumed that 1/3 of GHG emissions are from energy production sources, 1/3 are from mobile (transportation) sources, and 1/3 are from “other” (RCI, Agriculture, Forestry, etc).

Implementation Mechanisms

TBD – [as approved by the TWG]

Related Policies/Programs in Place

Federal Clean Air Act (CAA)

1. Per the CAA, for several years the Arkansas Department of Environmental Quality (ADEQ) has been developing emission inventories for pollutants caused by stationary and mobile sources that contribute to the formation of the criteria air pollutants (i.e., ozone, carbon monoxide (CO), nitrogen dioxide, sulfur dioxide, fine particulate matter, and lead) and regional haze. The pollutants that contribute to the formation of the criteria air pollutants include CO, volatile organic compounds (VOCs), oxides of nitrogen (NO_x), oxides of sulfur (SO_x), lead metal and lead oxides, and fine particulate matter. The pollutants that contribute to the formation of regional haze include NO_x, SO_x, ammonia, VOC, fine particulate matter, and elemental carbon. Certain sources are reported every year; other sources are reported every 3 years. Currently, no GHG’s are directly tracked or inventoried by ADEQ.

Arkansas Code Title 8, Regulation 18 excludes CO₂ as a pollutant. This regulation will need to be modified for a state agency reporting requirement and/or regulation of CO₂.

Type(s) of GHG Reductions

TBD – [as needed and 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 #8, #9, or #10]

Level of Group Support

TBD – [blank until GCGW meeting #8, #9, or #10]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

CC-2. State Greenhouse Gas Reporting and Registry

Policy Description

Greenhouse gas (GHG) reporting reflects the measurement and reporting of GHG emissions to support goal development, tracking and management of emissions. GHG reporting can help sources identify emission reduction opportunities, reduce risks, and potentially develop revenue associated with possible future GHG mandates by developing the required infrastructure in advance. Tracking and reporting of GHG emissions can also help in the implementation of periodic state GHG inventories. GHG reporting is a precursor for sources to participate in GHG reduction programs, opportunities for recognition, and a GHG emission reduction registry, as well as to secure “baseline protection” (i.e., credit for early reductions).

A GHG registry enables recording of GHG emission reductions in a central repository with “transaction ledger” capacity to support tracking, management, and “ownership” of emission reductions; establish baseline protection; enable recognition of environmental leadership; and/or provide a mechanism for regional, multistate, and cross-border cooperation. Properly designed registry structures also provide a foundation for possible future trading programs.

Policy Design

The reporting and registry functions go hand-in-hand. The reporting protocol and format must be aligned with the requirements of the registry provider. To be effective the registry must be applied on a national level, with an international registry being preferred.

Goals:

Encourage participation in a nationally recognized, voluntary reporting and registry program. Supplemental attention should be paid to protocol development for any particular sources or sinks/offsets that are specific to Arkansas. Efforts must be made to avoid duplication of reporting requirements on emission sources. Rely on the use of data that emission sources already report under existing and future state and federal programs to avoid duplication of reporting burden on the sources.

State of Arkansas

Participate in a reporting and registry program to develop knowledge on the reporting mechanism, reporting costs, registry requirements, and resource demands. Educate other private and public organizations on the requirements of participation.

Other Organizations

Facilitate and encourage voluntary participation in a reporting and a registry program. Acknowledgement or incentives should be provided for local governments, academic and nonprofit institutions, and businesses and regulated industries.

Timing:

1. State participation should be addressed as quickly as possible.
2. A plan for encouraging organizations to participate in a reporting and registry program should be developed concurrent to the state's participation in a program.

Parties Involved:

1. Arkansas State Agencies (lead-by-example)
2. Local governments, academic and nonprofit institutions, and businesses and regulated industries.
3. All GHG emission sources and sinks (both man-made and natural) should be included.

Other:

Existing Reporting and Registry Organizations:

1. The Climate Registry; a non-profit organization that supports a voluntary GHG emissions registry.
2. Canadian Standards Association, GHG CleanProjects™ Registry; provides a portal to report and showcase your project's GHG emission reductions or removals.
3. California Climate Action Registry; The California Climate Action Registry is a California-based private non-profit organization originally formed by the State of California. The California Registry serves as a voluntary GHG registry to protect and promote early actions to reduce GHG emissions by organizations.

Existing GHG Trading Organizations:

1. Chicago Climate Exchange (CCX), Launched in 2003, is the world's first and North America's only active voluntary, legally binding integrated trading system to reduce emissions of all six major GHGs, with offset projects worldwide.
2. International Emissions Trading Association (IETA), working for the development of an active, global GHG market, consistent across national boundaries and involving all flexibility mechanisms: the Clean Development Mechanism, Joint Implementation and emissions trading.

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 needed and 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 #8, #9, or #10]

Level of Group Support

TBD – [blank until GCGW meeting #8, #9, or #10]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

CC-3. Statewide Greenhouse Gas Reduction Goals or Targets

Policy Description

The GCGW is to recommend actions that can be taken in Arkansas to reduce the state's contribution and vulnerability to climate change. Consistent with this charge, the establishment of a statewide goal or target can provide vision and direction, a framework within which implementation of GCGW policy recommendations can proceed effectively, and a basis of comparison for regular periodic assessments of progress. Greenhouse gas (GHG) reduction goals or targets recommended by the GCGW should be consistent with the parallel goal of an efficient, robust Arkansas economy. In pursuit of similar climate progress, at least 18 other states have established GHG reduction goals or targets.

Policy Design

TBD

Goals: TBD – [as approved by the TWG]

Timing: TBD – [as approved by the TWG]

Parties Involved: TBD – [as approved by the TWG]

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 needed and 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 #8, #9, or #10]

Level of Group Support

TBD – [blank until GCGW meeting #8, #9, or #10]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

CC-4. The State's Own Greenhouse Gas Emissions (Lead-by-Example)

Policy Description

State and local government entities are responsible for providing a multitude of public services that are delivered through very diverse operations and result in wide-ranging greenhouse gas (GHG) emission activities. Because of this role, they have the opportunity to model a diverse array of GHG emission reduction activities for a wide variety of clients. State and local government entities should take the lead in demonstrating that reductions in GHG emissions can be achieved by analyzing current operations, identifying significant GHG sources, and implementing changes in technology, procedures, behavior, operations, and services provided.

State government can also encourage and/or provide incentives to reduce GHG emissions by others in a variety of ways. One of the most important is to link GHG reductions to energy expenditures, and demonstrate that reduction in one leads to reduction in the other.

Policy Design

The GCGW recommends that Arkansas establish GHG reduction targets for state and local government operations and school districts, with an emphasis on energy efficiency for both transportation and non-transportation uses. The establishment of these targets will be helpful in setting an example for nongovernmental entities and will help agencies to focus on doing the necessary analysis. Reductions should be reported at the agency level. Thus, state and local government agencies or departments would first need to develop agency- or department-specific GHG emissions inventory data, ideally building on existing energy use reporting data. This would become the baseline data for ongoing emission reduction activities and measurement, which could be included in annual reporting for all entities. Agency and/or department reports would be aggregated into a summary report reflecting state GHG emissions. A multi-agency group should oversee the on-going climate efforts of the government's agencies or departments, review their performance, and provide direction, guidance, resources, shared approaches, and recognition to agencies or departments and their employees that are working to reduce the government's GHG emissions.

Goals:

- Reduce GHG emissions from Arkansas state and local operations by (___percent – TBD) by (year - TBD), measuring from a (year - TBD) baseline.
- All state and local agencies and school districts should make continual progress toward the goal, regardless of their starting point.

Timing: The state's efforts to "lead-by-example" in reducing its own GHG emissions should start immediately. The first annual report by agencies should be due (TBD). The second annual report should reflect initial progress in reducing GHG emissions as agencies begin to plan and implement operational changes.

Parties Involved: Coverage should include all operations of all state agencies, authorities, quasistate entities, local governments and school districts.

Implementation Mechanisms

- (TBD), is charged with collecting energy use and cost data from state and local agencies (including state-supported institutions of higher education) and public school systems.
- To allow for sharing of information and success stories, (TBD) will convene on an annual or biennial basis a meeting of agency representatives. This meeting will facilitate education and outreach to agencies and employees, and will allow for recognition of agency progress.
- (TBD) will evaluate development of state contracts for the procurement of low-GHG products.
- All state agencies should consider GHG emissions in their evaluations of Environmental Assessments and Environmental Impact Statements and similar environmental studies. State agencies should consider life-cycle GHG emissions as they design and perform their day-to-day functions and services. For example, the Arkansas Department of Environmental Quality in considering Environmental Assessments and Environmental Impact Statements, the Arkansas Public Service Commission in considering energy projects, the Arkansas Department of Transportation in considering transportation projects, etc. Even without authority to control or reduce GHG emissions, raising them for examination will help increase awareness and perhaps consideration of lower-GHG alternatives.
- In the future, the state should consider climate-neutral bonding (i.e., no net increase in GHG emissions within the bond-issuing agency's geographical jurisdiction after the project becomes operational).

Related Policies/Programs in Place

TBD – [as needed and approved by the TWG]

Type(s) of GHG Reductions

TBD – [as needed and 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 #8, #9, or #10]

Level of Group Support

TBD – [blank until GCGW meeting #8, #9, or #10]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

CC-5. Comprehensive Local Government Climate Action Plans

Policy Description

“Think globally, act locally”, is the refrain often heard to bring action-to-bear on environmental issues within the average individual’s ability. Similarly, local government actions on climate change issues will be a keystone for achieving state and Federal climate action goals. There is no single approach that can be universally applied at the local level; however, local communities are often the incubator for new approaches that can be further developed and applied on a larger level. Local governments will report on progress on climate change issues and will provide innovative, multi-sector solutions that will be shared with others through a clearinghouse or other forms. The State will provide encouragement and assistance to local jurisdictions to sustain global warming objectives.

Policy Design

Local climate planning initiatives will address local mitigation opportunities which may change over time. Existing, regional planning data will be used to develop climate change baselines for various, high-value (GHG) sectors (transportation, energy use, waste generation, etc.) and to forecast changes in future growth or reversals. The local jurisdictions periodically will report their progress to the State on reducing global warming impacts so a comprehensive baseline is important when setting GHG targets, developing long-term sustainability plans, local adaptation measures, and requesting resources.

Local governments have many approaches and motives for undertaking and achieving reductions in GHG emissions. Jurisdictions participating in reducing global warming pollution more often than not are motivated by the desire to simply cut traffic, save tax money, clean the air, and improve quality of life in their communities. Local governments may develop collaborative agreements with organizations that advocate for a specific approach in order to simplify access to mechanisms for achieving results.

Goals:

Beginning in 2009, the State shall provide resources and materials to educate community planning and zoning officials about climate change, impacts, and opportunities. Regional meetings will be conducted to train local officials, discuss the State’s global warming program, review other jurisdiction’s approaches and lessons-learned, to emphasize assistance and resources, and to underscore value of collaboration. These meetings will be repeated periodically to:

1. Identify individual community leaders who are acting effectively on climate change; showcase and share their successes. Likewise, individual community leaders who are not yet acting on climate change should be encouraged to apply lessons learned. The State will host events periodically that focus on leading by example, sharing specifics on lessons-learned, opportunities, illustrating financial investments and payback, co-benefits, etc.

2. Identify, assist, and leverage community-based organizations that have expertise or interest in climate-related issues. Work with community-based organizations to identify and build upon climate issues related to their core mission.
3. Support and facilitate outreach and education within community-based organization regarding climate change issues and actions. Establish a network of community-based organizations acting on climate change so they can collaborate, organize joint events, etc.
4. Engage communities and students around university campuses to lead periodic meetings to reach-out on climate change, discuss impacts, sector-specific mitigation actions, and adaptation opportunities.
5. Sponsor university research on local government climate change initiatives and periodically provide detailed information to the media about the outcome, benefits, etc.

Timing: Fiscal Year 2009, identify local government leaders and model municipalities.

Parties Involved: Institutions, municipalities, service clubs, social & affinity groups, NGOs, etc.) Recognize leadership; share success stories & role models; expand involvement and participation within civic society.

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

Implementation Mechanisms

1. There are organizations focusing on global warming issues and local municipality action. Encourage municipal leaders to join ICLEI's Cities for Climate Protection program and/or the Mayors Climate Protection Agreement.
2. Local jurisdictions should be encouraged to collaborate with global warming projects with other municipalities in their region (including those out-of-state). Regional initiatives can be more efficient than programs at the state level, as they encompass a broader geographical area, eliminate duplication of work, and benefit from economy of scale. For example, regional initiatives have begun developing systems to reduce carbon dioxide emissions from power plants, increase renewable energy generation, track renewable energy credits, and research and establish baselines for carbon sequestration.
3. Increase carbon sequestration and reduce local heat islands by encouraging intensive tree planting programs and projects. Encourage Arkansas Highway and Transportation Department (AHTD) to plant many more trees along the highways. Encourage counties and cities to do the same with their roadways. Start "Up with Trees" programs. Encourage cities to set up new building codes that require shade trees for parking lots. Encourage builders to leave as many trees as possible to provide shade for new homes. Encourage developers and city tree-cutters to reuse their downed trees (e.g., turning them into wood pulp, paper, or home firewood) rather than landfilling them or piling them up on a field and burning them. Community air quality could be improved through burn restrictions.

4. Encourage the development of local farmers markets in cities and towns across the state. The closer food is grown to home the less energy is needed to transport it.
5. Revise State purchasing guidelines to promote the use of alternative fuel and flex-fuel vehicles, such as hybrid electric vehicles, in state fleets and in local government fleets. Promote the use and development of electric and hybrid electric vehicles. For example, use electric or hybrid electric community buses. Allow the state agencies to freely purchase hybrid electric vehicles. Put magnetic signs on the vehicles advertising that they are environmentally friendly.
6. Convert municipal street lights to LED (light-emitting diode) technology. (LEDs use about half the energy and last as many as 10 years longer than traditional “gas and glass” fixtures. IntenCity Lighting of Dardanelle is a leader in this field.)

Related Policies/Programs in Place

TBD – [as needed and approved by the TWG]

Type(s) of GHG Reductions

TBD – [as needed and 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 #8, #9, or #10]

Level of Group Support

TBD – [blank until GCGW meeting #8, #9, or #10]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

CC-6. State Climate Public Education and Outreach

Policy Description

The key for long-term success of Arkansas' Global Warming strategies lies with increasing the awareness of the issue as well as the societal costs, and benefits from adopting new policies and/or goals. Education of our citizens, our business leaders, and our policy-makers is integral to the successful implementation of changes to mitigate the effects of climate change on our environment, our economy, and our lifestyle. Outreach will extend our personal and cooperative commitment to reduce the effects of global warming to all sectors of endeavor as well as to future generations.

Policy Design

Global warming education and outreach would utilize the same practices as existing Arkansas Department of Environmental Quality (ADEQ) practices. ADEQ has an established network for education and outreach for issues similar to global warming (e.g., pollution prevention, clean air). The education and outreach program would include aspects of global warming actions developed from other sectors (i.e., forestry, energy supply, agriculture). Collaboration with non-governmental organizations will facilitate the public education and outreach of global warming options.

The State will provide education and outreach funding for public information messages regarding Arkansas' global warming on the various media. Other incentives may include educational materials developed for K-12, university-level syllabi, preference in contracting for businesses that employ global warming mitigation practices and/or products. The target audiences will be evaluated periodically to determine the extent of knowledge and the efficacy of global warming outreach efforts.

Goals:

The GCGW recommends that this policy address, at a minimum, the following target audiences:

Target audience: State Executive Agencies

The Governor should form a global warming education and outreach committee (coordinated by ADEQ) to educate the public and other audiences regarding climate change action plan, associated policies and to oversee outreach activities. The committee should be formed of appointees and supported by outreach coordinators from relevant state agencies (e.g., energy supply, forestry, agriculture, etc.). The committee should address the following:

- Create and maintain one or more “outreach coordinator” positions in relevant executive agencies specifically tasked with climate change issues.
- Assess the level (establish a baseline) of public understanding of the impacts of climate change and of (proposed) state-specific actions to deal with global warming.

- Establish a recurring awards program to recognize leadership and attainment of goals and objectives of the Arkansas global warming action plan.

Target Audience: General Public

Increase awareness and engage in climate change actions in personal and professional lives.

- Educate broadcasters, reporters, editorial boards, etc. about climate change, the risks it imposes, and State subset of solutions. Work with state broadcasters and print media associations to develop and run climate change public service announcements.
- Develop & maintain a state climate change website for the public including a clearinghouse of Arkansas-specific climate change information and resources.
- Work with existing business outreach efforts to customers to enhance awareness of climate change issues & opportunities.
- Provide—and advertise—marketplace incentives to adopt and purchase goods with the minimum global warming “footprint”.

Target Audience: Future Generations

Integrate climate change into educational curricula, post-secondary degree programs, and professional licensing to address the multidisciplinary approach to reduce adverse climate change effects.

- Ensure climate change public education (K-12) performance standards for science and social studies; identify (a) gaps in climate change education, and (b) specific curricula to fill any gaps.
- Integrate “best practices” into public school design & construction and use this as a means to educate the public about to educate students (and parents) firsthand in their communities & colleges.
- Organize groups of educators to identify, assemble, and employ climate change curricula appropriate to age groups. Make curricula and associated materials available to non-public-funded educational courses.
- Integrate climate change into core college curricula and promote research into climate change and solutions at state universities; develop university “Centers of Excellence” on climate issues, new approaches, and technologies.
- Develop assessment tools to determine the impact of climate change curricula.
- Include climate change discussions at State-funded venues, such as science centers, zoos, and museums.

Timing:

Fiscal Year 2009:

- Develop global warming educational objectives.

Fiscal Year 2010:

- Identify potential projects and resource needs.
- Develop appropriate educational materials and outreach programs with the expectation of yearly increases for several years to reach additional audiences.

Parties Involved: Prospective target audiences are the general public, the governmental leaders and staff (Federal, State and community), business and development, and higher education.

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 needed and 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

Commitment to global warming education and outreach may require additional resources.

Feasibility Issues

TBD – [as needed and approved by the TWG]

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #8, #9, or #10]

Level of Group Support

TBD – [blank until GCGW meeting #8, #9, or #10]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

CC-7. Optimizing Best-Scale of Reduction Policies

Policy Description

The Arkansas Climate Change Institute should investigate optimization of scale for each specific greenhouse gas (GHG) reduction area undertaken by the state and report its findings in its annual reports. These investigations should include inter-state and regional opportunities that optimize GHG reductions.

Policy Design

Goals: To guide the Arkansas Climate Change Institute investigations, “optimization” should be interpreted as opportunities that further increase the state’s overall reduction goals by at least 1% per year, or accelerate the achievement of certain goals by at least one year.

Timing: TBD – [as approved by the TWG]

Parties Involved: TBD – [as approved by the TWG]

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 needed and 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 #8, #9, or #10]

Level of Group Support

TBD – [blank until GCGW meeting #8, #9, or #10]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

CC-8. Creative Financial Mechanisms

Policy Description

Allocation of some resources under existing state programs and initiatives can be targeted to achieving state climate goals. However it is likely that additional resources may also be needed to implement the recommendations in the state plan. Therefore, the state and others will need to consider seeking and stimulating additional funding and investment in climate solutions identified in the state plan. Initiatives could include, but not limited to, establishing, promoting, and utilizing creative financing mechanisms for projects and products that reduce greenhouse gases (GHGs). Examples could include establishment of a “State Revolving Loan Fund” to finance products and services with low-carbon intensity, promote the use of “Green products” procurement preferences, and establish and promote greener buying cooperatives.

Policy Design

A State Revolving Loan Fund could be established to help offset costs to individuals, companies, etc., for projects that aim to reduce GHG levels through developing new technologies or implementing efficiency strategies/programs. A number of these types of programs already exist in the state but are focused in particular areas or programs like water allocation for example. Additional options should include the compiling of funding programs that could have the potential for financial assistance, such as foundations, non-profits, trusts, etc. An examination of other potential revenue sources from some tax base should also be considered. The idea of “creative” funding sources should be diverse and not limited to just one potential source in an effort to put as many options possible on the table. It is foreseeable that these programs could be managed in coordination with the Arkansas Climate Change Institute and state agencies.

Goals:

1. Establish a Revolving Loan Program focused on reducing green house gases in Arkansas.
2. Pursue potential tax options that would help fund the recommendations of the Governors Climate Change Commission.
3. Establish a data base of potential funders interested, or having had a recorded of funding environmental projects, like foundations or organizations.
4. Pursuit of potential for ballot initiatives such as impact fees.
5. Examine state incentive opportunities that might include tax credits.

Timing: By mid 2009.

Parties Involved: Arkansas Climate Change Institute, State Agencies, U.S. EPA, Foundations, Trust, Non-Governmental Organizations (NGOs), companies.

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 needed and 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 #8, #9, or #10]

Level of Group Support

TBD – [blank until GCGW meeting #8, #9, or #10]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

CC-9. Adaptation and Vulnerability

Policy Description

The state should seek funds from national funding institutes, i.e., National Science Foundation (NSF) or National Institute of Health (NIH), to help secure efforts for long time monitoring of climate change in the state. A climate change analysis center (i.e., Arkansas Climate Change Institute) for the collection and analysis of this data should be established using these funds.

Along with tracking the climate change data, Arkansas should encourage the development of a plan to manage the projected impact of climate change on our state and to reduce the state's contribution to greenhouse gases (GHGs). The state should work with industries and research universities to create an Arkansas Climate Change Institute. The establishment of the Institute should attract more researchers and scientists to the state to help stimulate industrial partners for new economic development and to create new "green" jobs for the state's citizens.

Along with existing local, state, and federal agencies, the Arkansas Climate Change Institute may help to address the impact of climate change. The impact issues would include identifying the climate change risks to: humans (i.e. factors that could contribute to disease); water resources (i.e. risk factors that could cause flooding, drought, pollution of waterways, etc.); temperature-sensitive populations (i.e. factors that could place immuno-compromised individuals at even greater health risks); ecosystems (i.e. animals and plants that may be affected with changes in their environment). Along with these adverse changes in our natural environment, climate change could also lead to damage of our energy systems, transportation system, communication systems, vital infrastructure (including public facilities), and our whole economic system. The analysis of these risks along with occurring climate change data can be used to create a model to project future problems and hopefully develop solutions to address these issues.

Coordinated responses to climate change issues should be put into effect through the appropriate local, state, and federal agencies to address encountered problems.

Policy Design

Goals and Timing:

By 2012, the State or appropriate agency will:

- Encourage grant writing with goals to acquire funds to establish an Arkansas Climate Change Institute.
- Develop an Arkansas Climate Change Institute, joining industry and research universities which will continually work toward solutions for climate impact issues.

By 2020, the State or appropriate agency will:

- Have established agencies in place to address climate change impact issues that will be constantly occurring.

- Have Climate Change Analysis Institute in place to record and analysis climate data that can be shared with other states and regions. This data can then be used to create models to project detrimental climate change issues and to broadcast these projections in advance.
- Arkansas Climate Change Institute should work together to monitor analysis and address arising climate change issues.

Parties Involved: Department of Natural Resources, National/State Weather Forecasters, Department of Forestry, Department of Energy, Department of Transportation, Department of Agriculture, Department of Economic Development, Ducks Unlimited, Audubon Society, U.S. Army Corps of Engineers, Centers for Disease Control, the State University Systems, National Institute of Health, National Science Foundation, Non-Governmental Organizations (NGO), National Oceanic and Atmospheric Administration (NOAA), and U.S. Environmental Protection Agency.

Implementation Mechanisms

When national environmental policies accept CO₂ and other GHGs as pollutants and suggest implementation of a national plan for their control, the state could then begin to seek federal grants from the NSF or NIH.

Related Policies/Programs in Place

Federal and state agencies, such as U.S. Environmental Protection Agency, National/State Weather Forecasters, U. S. Army Corps of Engineers, Federal Emergency Management Agency, etc. have been in place to address various environmental issues, and emergencies that may arise that may or may not be covered by this policy recommendation.

Type(s) of GHG Reductions

Not applicable.

Estimated GHG Reductions and Costs or Cost Savings

Not applicable.

Data Sources: Reports from various “parties involved” such as reports from National Weather Forecasters, Centers for Disease Control, Environmental Protection Agency, etc.

Quantification Methods: The Arkansas Climate Change Institute to acquire quantitative reports from the federal/state agencies mentioned and organizes these into a complete report that would present a broad, over-all analysis of the environmental impact.

Key Assumptions: National and regional agencies will be in place to share data and be involved in national/regional analysis and modeling future impact.

Key Uncertainties

- Acceptance of the federal government to approve CO₂ and other GHGs as pollutants, and to set regulations for controlling these pollutants.
- The uncertainty of the ultimate impact of GHGs on the state/national/world environment.

- The willingness of regional acceptance and participation in joint programs to help address the issues.

Additional Benefits and Costs

- Benefits would include:
 - Produce more “green” jobs for the state;
 - Raise public awareness so that citizens can understand the environmental, economical and social impact of GHG emissions and to reduce these levels on an individual level;
 - Create healthier environment by reducing GHG; and
 - Have emergency plans in place to address issues that may arise from drastic environmental changes.
- Additional cost may be if the Arkansas Climate Change Institute fails from lack of funding, and the impact of this loss falls back onto the previously existing state/federal agencies.

Feasibility Issues

The success of this policy will depend upon the federal acceptance of GHGs as pollutants and the funding from the various proposed granting institutes.

Status of Group Approval

Pending – [until GCGW moves to final agreement at meeting #8, #9, or #10]

Level of Group Support

TBD – [blank until GCGW meeting #8, #9, or #10]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

CC-10. Climate-Change Related Economic Development

Policy Description

Successful state GHG reduction efforts are highly dependent on active participation of the business community, particularly in the energy, agriculture, transportation, development and manufacturing sectors. The intent of this policy is to encourage and facilitate the involvement of funding and investment sources, business interests, and entrepreneurs in pursuing business opportunities associated with GHG reductions and global warming solutions as quickly and as significantly as possible. The creation of a clearinghouse-like entity may make it possible to match technology developers and other climate solution entrepreneurs with necessary financing more effectively and expeditiously. As a result, a state's ability to identify and secure early business opportunities associated with climate change may be enhanced, increasing its global competitive advantage and job creation within the state.

Potential funding sources include philanthropic organizations, high net worth individuals, or others interested in supporting innovative, environmentally effective market solutions. Recognizing that fortunes are likely to be made in the "new energy economy," for-profit investors, pension funds, mutual funds, and/or venture capitalists may be looking to fund similar business opportunities. Although technology entrepreneurs are often cited as offering potential global warming solutions, equally progressive solutions may lie in the fields of law, accounting, marketing, production, and even government relations and lobbying. The objective of this policy option is to leverage a state's specific talents for global warming solutions into securing the business opportunities and market advantages that well-supported "early bird" efforts are likely to reap in a carbon-constrained world.

Policy Design

In a continuing effort to reshape economic development in Arkansas, the recognized weaknesses in 20th Century models challenge new directions to incorporate broadened and dynamic global opportunities into the way state economies welcome sustainable and efficient production and creative activities that include reduced GHG levels. Accelerate Arkansas (<http://www.acceleratearkansas.com/>) has recently cited the importance of educational and community development to insure effective economic development that grows beyond the dominance of conventional manufacturing recruitment.

Goals:

- Design a mechanism to evaluate and monitor programs, missions, and agencies responding to changing trends in economic development as linked with GHG reductions, whenever possible.
- The state should conduct an in-depth evaluation of the structure and organization of development activities by state government agencies, commissions, and other organizations, to encourage and transition the variety of state and local public, private, and nonprofit

organizations into a structure that is in lock-step with necessary review processes and renewal cycles enabling GHG reductions and development renovations wherever possible.

- Consider economic development with greater emphasis upon what works “sustainably” for Arkansas and regional communities to establish GHG reductions as a means toward entrepreneurship and building a culture of continuous innovation and reconsideration.
- Leverage the state’s job creation and investment incentives into securing business and education opportunities that focus on improving economic development with GHG reductions.
- Identify likely funding mechanisms and policy tools that provide economic development and recruitment stimulus for not only new industries and businesses that feature GHG reductions, but also highlight benefiting infrastructure as it exists or is planned for Arkansas through implementing parties in support of renewable energy production.

Timing: TBD – [as approved by the TWG]

Parties Involved: Arkansas Economic Developers (AED), Arkansas Economic Development Commission (<http://arkansasedc.com/>), Arkansas State Chamber of Commerce-Associated Industries of Arkansas (AIA), Accelerate Arkansas, Arkansas Development Finance Authority, Arkansas Science and Technology Authority, Department of Workforce Education, the State’s University Centers for Business and Economic Research (i.e. UALR Small Business Development Center and Institute of Economic Advancement, U of A, Fayetteville Center for Business and Economic Research, ASU Delta Center for Economic Development, and others), Arkansas Assistance Procurement Center, U of A Cooperative Extension Service, Capital Access Arkansas, and the Office of State Procurement.

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

Implementation Mechanisms

TBD – [as approved by the TWG]

Related Policies/Programs in Place

Equity Investment Incentive Act of 2007, Advantage Arkansas (Income Tax Credit), TrustArk (Sales and Use Tax Credit), Tax Back (Sales and Use Tax Refund), Create Rebate Program, ArkPlus (Income Tax Credit)

Type(s) of GHG Reductions

TBD – [as needed and 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 #8, #9, or #10]

Level of Group Support

TBD – [blank until GCGW meeting #8, #9, or #10]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]

CC-11. Regulatory Realignment in Government to Encourage Constructive Climate Action

Policy Description

State government agencies can lead-by-example in efforts to control greenhouse gas (GHG) emissions by ensuring that their policies and regulations are climate-friendly. Each state agency should conduct a review of its policies and regulations to identify opportunities for realigning them to remove impediments to climate-friendly options. In addition, agencies should identify opportunities to utilize incentives to minimize the carbon footprint of state government as well as entities affected by state government regulations and policies (e.g., local governments and the private sector). Examples may include, but are not limited to, coordination and alignment between state agencies' policies and programs, reduced costs and/or timeframes for greener permits, "performance-based" regulations, and reducing or eliminating "throughput incentives" so that regulated utilities are compensated for demand-side reductions, not just supply-side activities.

Policy Design

Lead-by-example is one way to help spur activities that will ultimately decrease GHG emissions by state agencies. A multi-sector energy audit will help the state gain an understanding of where agencies currently stand on energy use, GHG emissions, and consumption. Once baseline data is collected, recommended goals should be set for reducing GHG emissions and increasing efficiency in state government. In addition, the Arkansas Climate Change Institute should examine policies that block opportunities for reducing GHG emissions in Arkansas. In coordination with other programs being recommended by the Governor's Commission on Global Warming (GCGW), establishing a demand-side reduction credit could be initiated to encourage energy consumption reductions.

Goals:

The state should amend the definition of "air contaminant" in Chapter 2 of the Arkansas Air Pollution Control Code (Regulation 18) to remove any barriers that prevent it from controlling CO₂ emissions.² This will enable Arkansas to mitigate CO₂, as well as to effectively coordinate its GHG mitigation policies and programs with future regional and national policies and programs.

The state should lead-by-example by implementing the following actions to mitigate its own GHG emissions:

1. Examination of state facilities and practices concerning GHG emissions.
2. Multi-sector energy audits on all state facilities.

² See Regulation 18, Chapter 2 (http://www.adeg.state.ar.us/regs/files/reg18_final_990215.pdf): "Air contaminant" means any solid, liquid, gas, or vapor or any combination thereof. The following shall not be considered air contaminants: water vapor, oxygen, carbon dioxide, nitrogen, hydrogen, and inert gases.

3. Set GHG reduction targets and standards for state government.
4. Examination of any policy barriers that are currently in place.
5. Annual progress tracking/reporting process.
6. Establish demand-side reduction credits for regulated utilities.

Timing: Statewide program in place within 15 months.

Parties Involved: State agencies, research entities, Arkansas Climate Change Institute, Universities, Non-Governmental Organizations (NGOs).

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

Implementation Mechanisms

State Audits

[Note: The following language will be modified as needed to ensure that it is coordinated with language that the RCI TWG develops for RCI-3 (Reduced Energy Use in State-Owned Buildings: Government “Lead-by-Example”)]

Audits of energy use and associated GHG emissions by state agencies are vital for establishing baseline levels needed to set achievable goals for reducing emission. It will be important to audit both state agency facilities and activities in order to fully assess and mitigate each agency’s carbon footprint. It will also be important for state agencies to audit energy use and GHG emissions annually for tracking progress toward meeting GHG reduction goals. In so doing, the GCGW recommends that state agencies consider a phased approach by assessing energy use and associated emissions for state facilities and then for state activities.

1. State Facilities – since facilities are stable and stationary entities, protocols for auditing energy use and emissions should be fairly routine to implement annually and would assist the agencies in developing experience that can be applied to assess energy use associated with their activities.
2. State Activities – development and implementation of protocols to assess energy use and emissions associated with state agency activities may be more difficult because activities vary depending on the mission of each agency, and are likely to change frequently even within an agency. Nevertheless, an analysis of energy use and emissions associated with agency activities is necessary to develop plans to mitigate GHG emissions and demonstrate progress toward meeting GHG emission reduction goals.

In addition, the state should consider a phased approach starting with the larger state government agencies first to develop protocols and experience that can then be used to assist smaller agencies and the university system. Such an approach should be designed to leverage experience and assessment tools that can be used by other entities (e.g., school districts) to foster consistency in developing and implementing audit protocols on a routine basis.

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

Related Policies/Programs in Place

TBD – [as needed and approved by the TWG]

Type(s) of GHG Reductions

TBD – [as needed and 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 #8, #9, or #10]

Level of Group Support

TBD – [blank until GCGW meeting #8, #9, or #10]

Barriers to Consensus

TBD – [blank until final vote by the GCGW]