

## Appendix J Cross Cutting Issues Policy Options

### Summary List of Policy Options

Policy No.	Policy Option	GHG Reductions (MMtCO <sub>2</sub> e)			Net Present Value 2009–2020 (Million \$)	Cost-Effectiveness (\$/tCO <sub>2</sub> e)	Status of Option
		2012	2020	Total 2009–2020			
CC-1	GHG Inventories, Forecasting, Reporting, and Registry	<i>Not Quantified</i>					Unanimous
CC-2	Statewide GHG Reduction Scenarios	<i>Not Quantified</i>					Approved (4 objections)
CC-3	State and Local Government GHG Emissions (Lead by Example)	<i>Not Quantified</i>					Unanimous
CC-4	Public Education and Outreach	<i>Not Quantified</i>					Unanimous
CC-5	Tax and Cap Policies—Lead Transferred to the CRE SC	<i>Not Quantified</i>					Transferred
CC-6	Seek Funding for Implementation of ICCAC Options	<i>Not Quantified</i>					Unanimous
CC-7	Adaptation and Vulnerability	<i>Not Quantified</i>					Unanimous
CC-8	Participate in Regional and Multistate GHG Reduction Efforts	<i>Not Quantified</i>					Unanimous
CC-9	Encourage the Creation of a Business-Oriented Organization To Facilitate Investment in Climate-Related Business Opportunities and To Share Information and Strategies, Recognize Successes, and Support Aggressive GHG Reduction Goals	<i>Not Quantified</i>					Unanimous

GHG = greenhouse gas; MMtCO<sub>2</sub>e = million metric tons of carbon dioxide equivalent; \$/tCO<sub>2</sub>e = dollars per metric ton of carbon dioxide equivalent; ICCAC = Iowa Climate Change Advisory Council; CRE = Clean and Renewable Energy; SC = Subcommittee.

## CC-1. GHG Inventories, Forecasting, Reporting, and Registry

### Policy Description

Greenhouse gas (GHG) emission inventories and forecasts are essential for understanding the magnitude of all emission sources and sinks (both man made [anthropogenic] 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 and mitigation opportunities, and in verifying GHG reductions associated with implementation of action plan initiatives.

GHG reporting supports tracking and management of emissions. It can help sources identify emission reduction opportunities, reduce risks associated with possible future GHG mandates through early participation, and construct periodic state GHG inventories. GHG reporting is a precursor for sources to participate in GHG reduction programs, and/or a GHG emission registry, as well as to secure “baseline protection” (i.e., credit for early reductions).

A GHG registry enables recording of GHG emissions in a central repository with “transaction ledger” capacity to support tracking, reductions management, and “ownership” of documented *emission* reductions; it offers recognition opportunities; and/or provides a mechanism for regional, multi-state, and cross-border cooperation. Properly designed registry structures also provide a foundation for possible future trading programs.

### Policy Design

The Iowa Climate Change Advisory Council (ICCAC) presents the option that the state institute a formal GHG inventory and forecast function within the Iowa Department of Natural Resources (IDNR) and in conjunction with the Iowa Office of Energy Independence (OEI), to be assisted by other state agencies as needed. IDNR should play a central role in the development and maintenance of the GHG inventory, forecast, reporting, and registry functions because the mission of OEI focuses the agency on both energy and GHG emission reductions. Construction of GHG expertise within OEI will assist the agency in developing energy and GHG emission reduction strategies as it administers its programs.

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The ICCAC notes that Iowa has joined the effort to develop a national GHG registry through The Climate Registry. Being a charter state in this effort should help ensure that Iowa’s needs and priorities are addressed in the course of The Climate Registry’s development. To the extent that Iowa’s needs may not be fully met by The Climate Registry, Iowa should consider developing supplemental or ancillary registry capacities.

Key elements of program design include:

#### *Inventory and Forecasting*

- The statewide inventory and forecasting function must include all anthropogenic emission sources and sinks within the state.

- As much as possible, the forecasting function should incorporate current and projected GHG emission trends based on business as usual, with additional scenarios that incorporate modified trends based on projected impacts of climate change.

#### *Reporting and Registry*

- The state should require mandatory reporting of GHG emissions by public and private organizations having net GHG emissions exceeding *de minimis* levels. *De minimis* levels should be set at levels that maintain consistency with existing and developing regional and national programs. By making reporting mandatory, Iowa businesses will gain advantage over competitors in non-reporting states through growing recognition of GHG emission sources and potential solutions.
- Optional reporting, or opt-ins, should be allowed for sources with GHG emissions below *de minimis* levels.
- Provision should be made for optional reporting of carbon sinks, including processes for aggregation and reporting of small-quantity sinks.
- Reporting should use the scoping approaches developed by the World Resources Institute in the GHG Protocol for segregation of direct and indirect emissions and to maintain the ability to denote ownership of emissions and emission reductions for potential crediting processes. (See: <http://www.ghgprotocol.org/standards> )
- Certification criteria for registry acceptance should be developed in accordance with existing and developing regional and national programs.
- Reporting should occur annually on a calendar-year basis for all six traditional GHGs as recognized by the Intergovernmental Panel on Climate Change.
- Every effort should be made to maximize consistency with federal, regional, and other states' GHG reporting programs.
- GHG emissions reports should be verified through self-certification and agency spot checks; to qualify for future registry purposes, reports should undergo third-party verification.
- Project-based emissions reporting should be allowed, when properly identified as such and when quantified with equally rigorous consistency.
- The reporting program should provide for appropriate public transparency of reported emissions.
- The reporting program should provide safeguards to allow baseline protection for sources.

#### **Goals:**

- Develop an inventory and forecasting capacity for statewide, anthropogenic emission sources and sinks.
- Develop a consistent protocol for use in preparing the statewide emission and sink inventory and forecasts.
- Develop a consistent protocol for use in implementing reporting requirements.

- Develop a periodic, consistent, and complete forecast of future GHG emissions in at least 5- and 10-year increments extending at least 20 years into the future.
- Annually provide a statewide GHG emissions inventory and forecast, as required by Iowa Code 455B.152(2a).
- Biennially provide a summary of progress toward meeting the ICCAC GHG emission reduction scenarios.
- Develop a mandatory GHG emission reporting program for sources with GHG emissions exceeding the *de minimis* threshold.
- Adopt established protocols and software to record and properly document GHG emissions and emission reductions for Iowa sources and sinks.

**Timing:** This function should be implemented as soon as possible when resources become available.

**Parties Involved:** IDNR, OEI, other state agencies as appropriate, all anthropogenic GHG emission sources and sinks.

**Other:** Not applicable.

### Implementation Mechanisms

**Inventory:** The state has already embarked on a very limited process to update the top-down statewide emission inventory. A much more robust inventory capacity is needed and will be developed, subject to available resources.

**Forecasting:** Forecasting will become a vital component of the ICCAC decision-making process. As such, provision should be made in ICCAC's mission to work with IDNR to facilitate the update of the forecasts on a biennial basis through ICCAC, subject to available resources. The forecasting should include adjustments for predicted changes in the Iowa economy, brought about in reaction to future climatic changes.

**Registry and Reporting:** Legislation may be required to institute a mandatory reporting requirement for entities with annual GHG emissions exceeding a *de minimis* threshold. The program should also lay out requirements for entity (facility/source) definition, offset\* definition, emission quantification and verification requirements, emission reduction documentation requirements, opt-in provisions for small sources, and an aggregation function for small offset providers.

The above initiatives are not currently adequately funded, so will need additional resources to implement.

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\* An offset is a verifiable reduction in GHGs. Offsets can be bought and sold and can be used to achieve compliance with GHG limits.

**Related Policies/Programs in Place**

**Inventory:** The state has already embarked on a process to update the top-down statewide emission inventory.

**Forecasting:** Using 2005 data for the Iowa inventory and forecast.

**Registry and Reporting:** Governor Culver signed Iowa on to The Climate Registry on July 5, 2007. As currently configured, The Climate Registry provides a voluntary platform for submission of GHG emissions.

**Type(s) of GHG Reductions**

Not applicable.

**Estimated GHG Savings and Net Costs or Cost Savings**

Not applicable.

**Key Uncertainties**

Adequacy of funding for implementation. Development of national or regional programs and what their substantive elements might be. Accuracy of reporting submitted.

**Additional Benefits and Costs**

IDNR estimated program costs = 2 full-time-equivalent positions and \$195,500, based on the state's fiscal year 2009 budget.

These systems will enhance the state's ability to track progress in reducing GHG emissions and will provide businesses a uniform reporting system.

**Feasibility Issues**

None identified at this time.

**Status of Group Approval**

Approved

**Level of Group Support**

Unanimous

**Barriers to Consensus**

None.

## CC-2. Statewide GHG Reduction Scenarios

### Policy Description

To date, Iowa has not adopted any mandatory statewide GHG reduction goals. Iowa Code Reference 455B.152(3)(a) and (b) and 455B.152(4), which the Iowa legislature passed in 2007, requires the IDNR to establish a GHG inventory and a voluntary GHG gas registry for tracking, managing, and crediting entities in the state that reduce their generation of GHGs. Under the same legislation, the ICCAC is required to recommend a baseline year from which to calculate future GHG reductions, and to develop multiple scenarios to reduce GHG emissions in Iowa by 2050, including interim years with targeted goals. A 50% reduction scenario by 2050 was specified in the legislation, and the ICCAC in its January 1, 2008, interim report recommended an additional scenario of 90% reduction by 2050, with subsequent scenarios to be determined for interim years of 2012 and 2020. The baseline year for Iowa is recommended in the Interim Report to be 2005.

Governor Culver issued the Green Government Executive Order (Executive Order 06) on February 21, 2008, which sets the goal of reducing “the use of electricity, natural gas, fuel oil and water in all state office buildings by at least 15% overall in the next 5 years, taking into account growth in the state workforce and/or changes in building operations.” This follows Governor Vilsack’s Executive Order 41 to reduce electricity and natural gas by 15% by 2010 from the year 2000 baseline. These executive orders are establishing policy goals of greater than 1.5% per year reductions in the use of fossil fuels for state building operations in the near term, and presumably they will result in similar GHG reductions for state buildings if fully implemented.

Legislation in 2007 also produced the Iowa OEI and the Iowa Plan for Energy Independence. The plan “shall provide cost effective options and strategies for reducing the state’s consumption of energy, dependence on foreign sources of energy, use of fossil fuels, and GHG emissions. The options and strategies developed in the plan shall provide for achieving energy independence from foreign sources of energy by the year 2025.” In addition, the Midwestern Governors Association adopted the Energy Security and Climate Stewardship Platform for the Midwest, which specifies an energy efficiency goal of at least 2% per year reduction in natural gas and electricity use to be achieved by 2015.

Transitioning from the fossil fuel age to a new mix of energy sources like energy conservation, efficiency, cellulosic biofuels, and wind power is already creating “green collar” jobs and invigorating the economy in Iowa. Early action alternatives have much greater effect in mitigating future climate change and its impacts compared to later reductions. Reductions for developed countries in the range of 25%–40% by 2020 and 80%–95% by 2050 were discussed in the initial Bali round of the Framework Convention on Climate Change in December 2007. It is recognized that “substantial deviation from baseline” will also be necessary for developing economies in Latin America, the Middle East, East Asia, and centrally planned Asia.

## Policy Design

During 2008, the ICCAC has evaluated the catalog of preferred options in terms of their potential to reduce GHG emissions in Iowa and their relative cost effectiveness. Following the construction of the baseline for Iowa emissions, the ICCAC has estimated the opportunities available and reductions considered most effective for the state to implement. The final report will be forwarded to the General Assembly of Iowa and to Governor Culver by December 31, 2008.

Additionally, a performance tracking mechanism should be established to measure progress over time in achieving the established GHG reduction goals.

**Goals:** Development of two scenarios by the ICCAC:

- Target GHG reductions of 1% below 2005 levels by 2012 and 11% below 2005 levels by 2020, culminating in a statewide GHG emission reduction of 50% below 2005 levels by 2050 from the 2005 baseline;
- Target GHG Reductions of 3% below 2005 levels by 2012 and 22% below 2005 levels by 2020, culminating in a statewide GHG emission reduction of 90% below 2005 levels by 2050 from the 2005 baseline.

**Timing:** Early action will be necessary to meet the scenarios for 2012 and 2020.

**Parties Involved:** The ICCAC will report to the General Assembly and Governor Culver. Initiation of legislation and/or executive action will be necessary for some specific alternatives. It is anticipated that Iowa business and industry, Regents Universities, community colleges, and numerous NGOs will also be involved in implementation.

**Other:** None.

## Implementation Mechanisms

It is anticipated that if the preferred options are fully implemented, it would set the state on the course of the 90% reduction goal by 2050. The ICCAC should divide the policy options into groups requiring action by the Governor's Office (through Executive Order), the General Assembly (through state legislation), other state government entities (e.g., the OEI), and nongovernmental organizations (NGOs). During 2009, ICCAC members may be involved with further design and development of these policy options and related implementation strategies.

Legislative and/or executive action will be needed for short-, mid- and long-term scenarios that are elements of the options proposed by the ICCAC. There is a need to develop a strategic system of incentives and disincentives. This should include provisions to establish appropriate enforceability provisions where needed.

## Related Policies/Programs in Place

The Midwestern Regional GHG Reduction Accord.

**Type(s) of GHG Reductions**

All GHG's.

**Estimated GHG Savings and Net Costs or Cost Savings**

See cumulative tables.

**Key Uncertainties**

Some of the key uncertainties are whether legislative action and funding occurs to implement pertinent elements of the CAP, whether implementation of the elements of the plan will be timely or adequate, and what the nature and elements of any potential federal and/or regional programs and requirements might be.

**Additional Benefits and Costs**

Reducing GHG emissions will have ancillary positive air quality and public health benefits due to reduced levels of other pollutants. New technologies will most likely be developed with broader applicability.

**Feasibility Issues**

Identified in individual options.

**Status of Group Approval**

Approved.

**Level of Group Support**

4 objections.

**Barriers to Consensus**

Several members were concerned that specific timetables for implementation and economy-wide impacts were not analyzed sufficiently.

### CC-3. State and Local Government GHG Emissions (Lead by Example)

#### Policy Description

State of Iowa property belongs to all Iowans, and its expansion and upkeep is funded by Iowans' tax dollars. The same is true for each Iowan's public school and city or county government. The majority of Iowans believe strong action is required to reduce GHG emissions. Government buildings, office equipment, and vehicles are present in every Iowa community and are among the biggest energy consumers in the state. As such, they represent a very significant opportunity for changing the course of Iowa's energy use.

State and local governments should be at the forefront of energy efficiency and renewable energy. By installing the most efficient technology and tapping local power sources, governments can reduce their own GHG emissions, create a significant opportunity for businesses to create and install efficient and/or renewable technologies, create a tested pool of Iowa-specific best practices, build communities' sense of pride in their governments (perhaps boosted by tax decreases and economic benefit), and spur residents and businesses to pursue energy efficiency and renewable energy.

#### Policy Design

**Goals:** Iowa is already considered a leader in energy efficiency and renewable energy. However, given the substantial costs and benefits, state and local governments must take further action.

The Governor should consider instituting a "Governors Challenge" to the state agencies and the people of Iowa. Under the challenge, each state agency should produce an annual GHG budget. In addition to the assessing its own GHG emissions, Iowa should assist cities and counties in completing similar assessments so community governments do not waste their limited resources.

State and local governments should take immediate actions to reduce their energy use and increase efficiency. For example, all existing buildings should be assessed for upgrades, and all cost-effective measures should be implemented; and all existing vehicles should be properly maintained so they perform at their highest capacity.

State and local governments should consider efficient possibilities in all procurements, for example:

- All new buildings and renovations should meet sustainable design or development standards, as will be developed in the State Building Code Update.
- Newly purchased vehicles should have the highest practical fuel and GHG efficiency.
- All new office equipment and appliances should be ENERGY STAR-certified where applicable.

State and local governments (with technical assistance from the state) should assess the renewable energy resources in their vicinities to see if they are economically feasible for development. Twenty percent of state and local governments' electricity should come from

renewable sources by 2020, either from their own production or purchased from their energy company.

The state should hold an annual contest to have Iowans submit ideas for how state government could exceed its GHG emission reduction scenarios. For example, testing an idea, such as a carbon-neutral legislative session, would reduce GHG emissions, draw attention to the state's other energy efforts, and create excitement about reducing emissions.

The ICCAC should hold workshops for state employees on various themes for lowering their carbon footprints; this could be done in collaboration with the actions described in policy option CC-4 (Public Education and Outreach).

**Timing:** Various, depending on the initiative, but starting as soon as possible.

**Parties Involved:** All levels of government operating in Iowa.

### Implementation Mechanisms

- Legislative and/or executive action will be needed for short-, mid- and long-term Scenarios developed by the ICCAC, and/or other elements of the CAP.
- Review of agencies' and communities' GHG budgets, recognition of leaders, and accountability for progress in reducing GHG emissions.
- Implementation of all cost-effective energy efficiency measures.
- Procurement of low-GHG products.
- Assessment of renewable energy potential followed by implementation.
- An annual contest sponsored by the state for Iowans to submit ideas for how state government could go above and beyond current scenarios in reducing its GHG emissions. For example, testing an idea, such as a carbon-neutral legislative session, would reduce GHG emissions, draw attention to the state's other energy efforts, and create excitement about reducing emissions.
- ICCAC workshops for state employees on various themes for lowering their carbon footprints.
- Using the rulemaking process of the State Building Commissioner to update the State Building Code with sustainable design and development standards.
- Use of state employee incentives and disincentives.
- Legislative implementation (tax credits, taxes, subsidies, command-and-control legislation), executive action, cap-and-trade markets, and voluntary measures are all anticipated.

### Related Policies/Programs in Place

Executive Order 06 established a Green Government Initiative. The Governor's order sets goals to improve energy efficiency in three areas (buildings, materials, and biofuels), and will establish separate task forces to address these issues.

The Energy Excellent Buildings Task Force will focus on “greening” new and existing state office buildings and facilities, including leased space. The goal of the task force will be to reduce the use of electricity, natural gas, fuel oil, and water in all state office buildings by at least 15% overall in the next 5 years, taking into account growth in the state work force or changes in building operations.

The goal of the Sustainable Materials Task Force will be to promote resource efficiency.

The state will be assigning an energy manager within each agency.

The Biofuels Task Force will focus on at least three issue areas: increasing the use of biofuels by state agencies to the maximum amount feasible, reducing the number of vehicle miles traveled by state employees, and increasing the fuel efficiency of the state vehicle fleet.

In addition, the order requires a thorough review and audit of executive branch agencies’ current practices related to energy efficiency and conservation. Using the audit data, the steering committee will develop a Master Plan on how to “green” state government, and track progress of state agencies.

Several Iowa communities’ mayors have signed the U.S. Conference of Mayors Climate Protection Agreement. Under the Agreement, participating cities commit to take following three actions:

- Strive to meet or beat the Kyoto Protocol scenarios in their own communities, through actions ranging from anti-sprawl land-use policies, to urban forest restoration projects, to public information campaigns;
- Urge their state governments, and the federal government, to enact policies and programs to meet or beat the greenhouse gas emission reduction target suggested for the United States in the Kyoto Protocol—7% reduction from 1990 levels by 2012; and
- Urge the U.S. Congress to pass bipartisan greenhouse gas reduction legislation, which would establish a national emission trading system.”

The mayors have signed on in the following Iowa communities: Altoona, Ames, Audubon, Aurelia, Bellevue, Carlisle, Cedar Falls, Cedar Rapids, Charles City, Clive, Coralville, Crystal Lake, Davenport, Decorah, Des Moines, Dubuque, Fairbank, Fairfield, Grafton, Hiawatha, Iowa City, Lawler, Lawton, Neola, Rake, Sageville, Shenandoah, Sioux City, Spirit Lake, Steamboat Rock, Wapello, West Des Moines, Windsor Heights, Woolstock.

#### **Type(s) of GHG Reductions**

Not applicable.

#### **Estimated GHG Savings and Net Costs or Cost Savings**

Not applicable.

**Key Uncertainties**

Key uncertainties are whether there will be adequate resources and staff to implement the options and whether there will be a sustained commitment from state and local political leaders.

**Additional Benefits and Costs**

Improved energy efficiency should lead to lower relative energy costs. Climate leadership by state and local governments should help lead the way to national action, improved development of renewable energy sources, and widespread utilization of energy efficiency initiatives. Improving energy efficiency will also provide a boost to the economy.

**Feasibility Issues**

None identified at this time.

**Status of Group Approval**

Approved

**Level of Group Support**

Unanimous

**Barriers to Consensus**

None

## CC-4. Public Education and Outreach

### Policy Description

The goal of climate change education extends well beyond the goal of conventional education, because it seeks not only to impart cognitive knowledge, but also to translate knowledge into positive action. Failure to appreciate this distinction has led to stagnation and lack of successful approaches in creating a public that is literate about issues relevant to climate change. According to the seminal work of Hungerford and Volk (1990),<sup>1</sup> there are three levels of environmental awareness:

- *Simple Awareness*—Knowing about the existence and importance of an environmental issue, but being unfamiliar with its complexities and having little relationship to personal change or action.
- *Personal Conduct Knowledge*—Understanding an environmental issue that lends itself to changes in personal conduct, but does not require detailed comprehension.
- *Environmental Literacy*—The outcome of a sound program of environmental education in which the learner progresses to deeper knowledge, and can apply it to address complex environmental issues and make wiser decisions.

Public education and outreach programs should address the public’s responsibility to maintain clean air, pure water, and fertile soil for their children and future generations. Adding to the challenge is that environmental information absorbed by the public stems from a diverse and unconnected smattering of sources that includes television, radio, print media, environmental groups, government publications, the Internet, the classroom, personal readings, chatting with friends, and other experiences. In general there is no quality control for the information. In the end, those seeking to learn about environmental issues are often left with little more than a collection of factoids, numerous and often conflicting opinions, and very little understanding—not enough to get beyond the “simple awareness” level cited above. Undoubtedly, excellent resources are available for public environmental education, but they may be lost in the background noise emanating from the cacophony of messages from disparate other sources.

There is not much detailed information about the level of climate change awareness in Iowa. The available evidence, however, suggests that it may not extend much past “simple awareness,” because there doesn’t appear to be significant change in personal conduct with respect to steps that would mitigate climate change. For example, optimizing energy efficiency is a major strategy for reducing GHG emissions, but a recent comprehensive study commissioned by the Iowa Utility Association shows enormous untapped potential in realizing that goal for Iowa.

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<sup>1</sup> Hungerford, H.R. and T.L. Volk (1990). Changing learner behavior through environmental education. *Journal of Environmental Education* Spring; 21(3):8–21. Available at: [http://eric.ed.gov:80/ERICWebPortal/custom/portlets/recordDetails/detailmini.jsp?\\_nfpb=true&\\_ERICEstSearchSearchValue\\_0=EJ413973&ERICExtSearch\\_SearchType\\_0=no&accno=EJ413973](http://eric.ed.gov:80/ERICWebPortal/custom/portlets/recordDetails/detailmini.jsp?_nfpb=true&_ERICEstSearchSearchValue_0=EJ413973&ERICExtSearch_SearchType_0=no&accno=EJ413973).

There is an urgent need for a comprehensive, objective, and authoritative climate change education campaign for Iowa that will improve the knowledge base and motivate individuals, communities, and organizations to take action to will reduce their GHG emissions.

## Policy Design

**Goals:** The goal of the proposed education campaign will be to move Iowans beyond “simple awareness” about climate change to “personal conduct knowledge.” Progressing to “climate change literacy,” the highest level of awareness, is a loftier goal, certainly worthy of achievement, but beyond the scope of the work proposed here. Even the more modest goal of achieving “personal conduct knowledge” is very ambitious, and will require a multi-year stepwise approach.

To achieve this goal, the state should consider forming a consortium on *Climate Change Education & Empowering Citizens Through Positive Actions*. The consortium would be led by the three Regents Universities, but would also involve private colleges, community colleges, and numerous other Iowa organizations involved in education, outreach, and concern about climate change and future generations.

The ICCAC has identified six target audiences for the education campaign: state government, policy makers, industrial and economic sectors, future generations, community leaders and community-based organizations, and the general public. State government is being addressed in large part under CC-3 (State and Local Government GHG Emissions [Lead by Example]). The consortium will assist this effort in the first year by hosting workshops on energy efficiency and renewable energy for state workers. Similarly, the consortium will address the needs of policy makers through a series of seminars and workshops to educate and promote conversations about climate change and effective solutions. With regard to an education plan for targeted industrial and economic sectors, the consortium will seek collaboration with the utilities and the Market Advisory Group established under CC-5 (Cap-and-Tax Policies [transferred to Clean and Renewable Energy Subcommittee]). The task of educating future generations will require comprehensive discussion with the Iowa Department of Education to assess the feasibility and promote the inclusion of integrating climate change into educational curricula and post-secondary degree programs.

The goal of educating community leaders, community-based organizations, and the general public across Iowa requires a far more extensive approach that the consortium proposes to achieve in a three-step plan. At the moment there is very little detailed information about what Iowans know and don't know about climate change, or about their willingness to take significant steps to reduce its impacts. Telephone surveys are somewhat useful, but there is often a large disparity between what people say on the phone and what they actually know and do in real life. A far better means to weigh public attitudes is to engage the public in face-to-face dialogue in a town meeting format. The consortium will address this need in Step 1. The subsequent steps in the education campaign will be guided by the findings determined in step 1.

**Step 1: Baseline Information: Analysis of Educational Needs and Preference for Positive Actions (Year 1)**

In this step the Iowa State University (ISU) Extension Service will engage numerous Iowa communities in conversations about climate change. This will guarantee broad coverage, since the ISU Extension serves every county in the state. We propose to adopt the approach the ISU Extension applied to promote public dialogue on the issue of the bioeconomy (*The Bioeconomy in Iowa: Local Conversations*, 2007), which covered 92 counties with an audience of more than 950 Iowans.

The county meetings on climate change will have two goals.

- To gain a multifaceted perspective on the attitudes Iowans have about climate change, the degree to which they agree or disagree with the science, factors that influence their opinions, whether they perceive climate change as a threat to future generations, what aspects they wish to learn more about, and a host of other issues.
- To present a large menu of possible individual and community-based actions to mitigate climate change, and to glean from the participants the actions they are most willing to undertake.

As recommended by the ICCAC, special attention will be given to low-income communities. The information gathered at the county meetings will provide grist for a climate change education plan tailor-made for Iowans. One tangible outcome of the analysis will be a white paper on “Climate Change Education and Seeking Solutions Through Positive Actions,” which will provide the knowledge base for conducting Step 2.

Each participant at the county meetings will be asked to complete a survey prior to the meeting to gauge their knowledge about climate change and actions that could mitigate climate change. This survey will provide baseline data for evaluating the project.

**Step 2: Enact Education Campaign (Year 2)**

This step would promote multiple forums for educating Iowans about climate change, and empowering individuals to take personal action to mitigate climate change. The ISU Extension will again play a pivotal role in this step, hosting another series of statewide town meetings to launch the plan. We would invite the participation of numerous other organizations as well. Such organizations would include (but are not limited to): Iowa private colleges, community colleges, 4-H Clubs, Chambers of Commerce, the utilities and natural gas providers, Interfaith Power & Light, school boards, Boy/Girl Scouts, and I-RENEW.

The work of these organizations would be supported as needed by training sessions, printed materials, videos and Web casts, a Web site dedicated to the campaign, and other outreach resources. Empowering citizens will be given a high priority, and teams will be trained to present specific issues and address designated target audiences. The content presented would depend on the findings of Step 1, but could include such subject areas as reducing your carbon footprint, weatherizing homes for the elderly, planning and building community bike trails, designing new homes and retrofitting old homes to optimize energy efficiency, installing ground-source heat pumps, and improving energy efficiency in school buildings. We would add an interactive component to the education/empowerment campaign by installing a Wiki Web site to promote

dialogue with the Iowa public. All citizens and communities that conduct positive actions will be encouraged to report those actions at town meetings or on the project Web site.

### **Step 3: Impact Assessment, Recognizing Success, Public Dissemination (Year 3)**

This step will ensure that the work of the education campaign is quantified, rewarded, and disseminated to the wider public, both statewide and nationally. Another set of town meetings hosted by the Extension Service will facilitate this step. A post-education-campaign survey will be conducted and compared to the baseline survey completed in Step 1 to measure the degree to which the campaign succeeded in moving the public from “simple awareness” to “personal conduct knowledge.” All citizen and community actions reported at the county meetings will be entered into the project’s database for cataloguing and assessment. A carbon footprint calculator will be applied to quantify reductions in GHG emissions based on the reported actions. The results of the assessment will be documented in a written report and posted on the Internet.

Competitions will be set up among counties for the most successful and creative actions conducted to mitigate climate change. A team of judges will be appointed to select the winners, who will receive awards at the State Capitol with much fanfare. A set of case studies based on the individuals and communities entering the competition will be prepared, and a book featuring their work will be published and posted on the Internet. The successes of the education campaign will be aggressively publicized via radio, television, print media, Web site postings, and other effective ways to disseminate the results.

### **Evaluation of the Project**

The project will be evaluated in multiple ways. Surveys gauging knowledge about climate change and actions that can be taken to mitigate it will be administered before and after the education campaign. The analysis will provide an assessment of the extent to which citizens progressed from “simple awareness” to “personal conduct knowledge.” The number of participants at the county meetings will be tallied, as well as the number of individuals and communities conducting positive actions to reduce GHG emissions. The carbon footprint calculator will quantify reductions in GHG emissions resulting from those positive actions, and the number of “hits” on the Wiki Web site will be tracked.

**Timing:** The education campaign will take 3 years, with each of the three steps conducted in consecutive years. It would be preferable to begin Step 1 in early 2009.

**Parties Involved:** The University of Northern Iowa, Iowa State University, University of Iowa, private colleges, junior colleges, 4-H Clubs, Chambers of Commerce, the utilities and natural gas providers, Interfaith Power & Light, school boards, Boy/Girl Scouts, and I-RENEW. This list is by no means exhaustive, and other collaborations will be sought as the campaign evolves.

**Other:** None currently identified.

### **Implementation Mechanisms**

The proposed Climate Change Public Education and Outreach Program is ready to be implemented, as detailed in the three-step plan described above. Each of the three Regents

Universities has agreed to participate and is prepared to begin the project as soon as funding is secured.

The education campaign will focus on individual and community-wide efforts to lower the carbon footprint of participating members. Carbon emission reductions will be achieved by promoting measures, such as implementing ENERGY STAR appliances, bicycling and walking as alternatives to car transport, installing geothermal heat pumps, and designing new homes and retrofitting old homes to optimize energy efficiency.

The campaign will implement a Web-based carbon footprint calculator so that participants can quantify reductions in GHG emissions from their reported reduction actions. The cumulative emission reductions will be summed for an overall measure of the metric tons of equivalent carbon dioxide (tCO<sub>2</sub>e) saved. This calculation will most likely underestimate total carbon reductions, as it is not expected that all reductions actions will be measured or reported.

At this time it is not possible to calculate the costs per tCO<sub>2</sub>e saved. However, they can be estimated by asking the participants who log on to the calculator to estimate the costs of implementing their reduction measures. The cumulative sum of the reported implementation costs, plus the costs of the education campaign itself, can provide an estimated overall cost. This cost can be divided by the estimated tons of equivalent CO<sub>2</sub> saved.

Once funding is in hand, the Regents Universities will seek collaboration among the other organizations described above in the Parties Involved section.

#### **Related Policies/Programs in Place**

Currently, no related programs are in place in the state that cover education and outreach areas to the same depth and breadth as the proposed three-step plan described here. Numerous straw policy options from other ICCAC subcommittees have educational components, which are currently unfunded as well.

#### **Type(s) of GHG Reductions**

Not applicable.

#### **Estimated GHG Savings and Net Costs or Cost Savings**

Not applicable.

#### **Key Uncertainties**

Key uncertainties include whether funding will be available to implement the CAP, the level of participation and receptivity of audiences, and how well participants absorb the proposals and ultimately act on them.

#### **Additional Benefits and Costs**

The costs for staffing are estimated to be approximately \$300,000/year, plus a \$135,000/year cost share for implementing entities.

The main benefit will be a means for empowering individuals and communities to do their part in reducing GHGs. Many Iowans would be willing to lower their carbon footprint, but lack understanding of the issues and information about positive actions that can be undertaken. The campaign will seek to bridge the gaps in understanding and know-how.

It is expected that the benefits will extend well beyond the timeframe of the campaign and the number of people who actually participate in it. The statewide dissemination effort described in Step 3 will demonstrate the success of the campaign and encourage other individuals and communities to participate. An educated and informed public will most likely ensure that the momentum built during the 3-year campaign will be self-sustaining after the campaign has officially ended.

### **Feasibility Issues**

None identified at this time.

### **Status of Group Approval**

Approved

### **Level of Group Support**

Unanimous

### **Barriers to Consensus**

None

## CC-5. Tax and Cap Policies

### Policy Description

The lead for developing this policy option was transferred by the ICCAC to the Clean and Renewable Energy Subcommittee.

## CC-6. Seek Funding and Financing for Implementation of ICCAC Options

### Policy Description

Funding must be obtained to implement some ICCAC options. In Iowa there are two organizations that fund projects related to the ICCAC goals: the Iowa Power Fund and the Iowa Energy Center, both described below. Out-of-state and federal funding sources should also be considered. For all sources of funding, success would be enhanced through partnerships with other organizations and agencies.

### Policy Design

**Goals:** Establish financing mechanisms and obtain funding necessary to implement the ICCAC's options.

**Timing:** Seek funding beginning in 2009 for implementation of the ICCAC's options. A schedule can be created after the ICCAC prioritizes which grants or foundations will be approached.

**Parties Involved:** Key partners in seeking financing and funding mechanisms could include federal and state policy makers, NGOs, business representatives, academic community, financial investment managers, citizens, and others.

**Other:** None currently identified.

### Implementation Mechanisms

The ICCAC will need to determine who is responsible for writing grant proposals or approaching foundations for funding, as well as prioritizing which organizations should be approached first. The ICCAC may also consider hiring a grant writer, if necessary.

### Related Policies/Programs in Place

The Iowa legislature created both the ICCAC and Iowa Power Fund Board in 2007. Although the two organizations are separate, they share similar goals of GHG reduction and control of climate change through increased energy efficiency and use of renewable energy. The Iowa Power Fund consists of an appropriation of \$25 million per year for 4 years. The funds are to be used to increase Iowa's research, development, and use of sources of renewable energy, improve efficiency, and reduce GHG emissions. Applications can come from businesses, individuals, government entities, nonprofit organizations, and academic institutions. Projects are evaluated on their originality, impact, and amount of cost shared by others. More details are available on the OEI's Web site at <http://www.energy.iowa.gov>.

Another Iowa source of funding is the Iowa Energy Center, which provides two funding options. The conference and small demonstration grants provide up to \$7,500, and proposals are accepted throughout the year. Pre-proposals for larger projects must be submitted annually; if accepted a

full proposal is requested. More details are available on the Iowa Energy Center Web site at <http://www.energy.iastate.edu>.

#### **Type(s) of GHG Reductions**

Not applicable.

#### **Estimated GHG Savings and Net Costs or Cost Savings**

Not applicable.

#### **Key Uncertainties**

The key uncertainties are whether there will be adequate resources and staff to implement the CAP options, whether there will be a sustainable commitment from state and local political leaders, and whether funds will be forthcoming from the Midwestern Governors GHG Accord process for the states.

#### **Additional Benefits and Costs**

Many grants require cost sharing. Partnering with other organizations may help secure these matching funds, as well as lead to mutually beneficial networking and sharing of ideas.

#### **Feasibility Issues**

Although finding the time to write grants and securing cost share will be a challenge, it should be within the powers of the members of the ICCAC.

#### **Status of Group Approval**

Approved

#### **Level of Group Support**

Unanimous

#### **Barriers to Consensus**

None

## CC-7. Adaptation and Vulnerability

### Policy Description

Because of the existing buildup of GHGs in the atmosphere that has already occurred or is underway, Iowa will experience effects of climate change for years to come, even if immediate action is taken to reduce its future GHG emissions. While Iowa may be less dramatically affected than coastal or arid regions of the country, the state will need to adapt to different sets of vulnerabilities, which may include such impacts as increased public health risks, urban infrastructure demands, and refugee movement. Thus, it is essential that the state develop a plan to manage the projected impacts of global climate change affecting Iowa, while broader mitigation efforts to lower atmospheric concentrations worldwide are being developed and implemented. Part of our adaptation must include strategies for mitigating and addressing human suffering, so that no one segment of the population or any of Iowa's natural resources or natural heritage sites suffers catastrophically.

### Policy Design

Iowa should develop, adopt, and implement a Climate Change Adaptation Plan that includes identification of scenarios covering (1) potential short-, mid-, and long-term impacts of climate change that may affect the state, and (2) implementation mechanisms for addressing these impacts.

That being said, given that the effects of climate change are already happening, the state cannot simply wait for a report before taking action to adapt to these known and predictable changes. Each segment of the Iowa economy and community, and appropriate representatives of each of Iowa's natural heritage areas should begin immediately to develop action plans to offer assistance to those most dramatically affected, mitigation of those impacts where feasible, specific initiatives to draw down their GHG emissions, and most important, strategies for remaining viable and robust by adaptation to changing circumstances.

These action plans should be collated and redacted into a single coherent State of Iowa Adaptation Plan that avoids contradictions, increases efficiencies, minimizes redundancies, and fills in the gaps. The state Climate Change Adaptation Plan should include at least the following key elements:

- Comprehensive identification of potential short-, mid-, and long-term impacts associated with climate change in Iowa.
- Recommended steps to minimize risk to humans, natural and economic systems, water resources, temperature-sensitive populations and systems, energy systems, transportation systems, communications systems, vital infrastructure and public facilities, and natural lands (such as wetlands, forests, and farmland), and all other identified and affected sectors or areas of concern throughout the state.
- Coordination of response efforts through the appropriate state, local, and federal agencies, organizations, or other entities or initiatives.

- Characterization of the potential risks and costs of inaction; characterization of the potential costs, benefits, and co-benefits associated with specific policy and program actions; and establishment of time- and program-based goals.
- Use of cost-effectiveness analysis to guide and inform the development and implementation of the state Climate Change Adaptation Plan. The analysis should include an examination of the benefits and costs of adaptation measures or responses relative to a status quo or no-action approach, and the resources needed to implement adaptation measures in the plan. The results of the cost-effectiveness analysis should also be used to set priorities for addressing short-, mid-, and long-term impacts of climate change on Iowa's citizens, ecosystems, and economy.
- Creation of a scientific strategy that engages the public, educational institutions, and state agencies in the monitoring of climate and ecological trajectories in Iowa to improve updates to the Adaptation Plan.
- Adaptation measures that also mitigate GHG emissions should be given priority in the state Climate Change Adaptation Plan.
- The Plan should be reviewed and updated every 5–10 years to expand or refine it as necessary, to improve its implementation, and to incorporate new information as it becomes available.

**Goals:**

- Develop a comprehensive state Climate Change Adaptation Plan that identifies opportunities to address adaptation issues and risks to Iowa citizens and recommends tangible, implementation measures to mitigate them.
- Conduct cost-effectiveness analyses comparing the potential costs of a status quo approach, as opposed to implementing the options proposed in the Climate Change Adaptation Plan.
- Prioritize options in the Adaptation Plan, based on the certainty and severity of adverse impacts to citizens, ecosystems, and local economies.
- Ensure that development of the plan (1) involves all affected agencies and entities at all levels of government; (2) engages all affected sectors and interests; and (c) provides for periodic review and update concerning adaptation risks, responses, and opportunities in the state.

**Timing:** The smaller local groups should begin immediately. “Low-hanging fruit” opportunities should be addressed as rapidly as feasible (even before the Climate Change Adaptation Plan is established, if possible), and proactive adaptation initiatives should commence within the next 2–3 years. The Climate Action Adaptation Plan should be in place by the first intermediate timeline of 5 years. Parallel public education and outreach efforts regarding adaptation should commence immediately.

**Parties Involved:** The following constituencies should be called upon to create action plans: state and local governments; school districts and institutions of higher learning; hospitals, clinics, and hospices; agriculture organizations; NGOs, including such environmental organizations as

The Nature Conservancy Iowa, and the Sierra Club; religious congregations; and social service organizations.

The Governor and the Iowa legislature should pursue the possible establishment of a Commission on Adaptation to Climate Change, including proper funding. The commission should then involve and coordinate with all appropriate state and local agencies, organizations, and institutions (e.g., universities) to ensure that all potential impacts are identified and to ensure the successful development and implementation of the plan. The role of ICCAC, if any, needs to be defined.

### **Implementation Mechanisms**

- Review available reports from state and national adaptation plans.
- Develop a catalog of adaptation policy options.
- Prioritize options and recommend possible standards and codes.
- Provide public education and outreach programs.
- Coordinate with existing state agencies to establish and maintain a Web-based resource for adaptation to the most pressing vulnerabilities.

### **Related Policies/Programs in Place**

Federal, state, and local emergency response plans for natural disasters. The need to coordinate with these agencies to evaluate potential increases in violent weather (due to climate change) is essential for our citizens. Such an initiative is already emanating from Iowa State University, where professors are leading the drive for a “Climate Science and Impacts Initiative.”

The state is taking steps to address the aftermath of the recent tornadoes and floods in Iowa through the “Rebuild Iowa” effort.

IDNR has hired a staff person within the Conservation and Recreation Division to prepare a strategy for dealing with the ecological climate change effects on water, soils, forests and prairies, fisheries, and wildlife.

### **Type(s) of GHG Reductions**

Not applicable.

### **Estimated GHG Savings and Net Costs or Cost Savings**

Not applicable.

### **Key Uncertainties**

There is uncertainty about the nature, magnitude, and geographic variability of impacts that will result from climate change in Iowa. There is also uncertainty regarding impacts on public health and on wildlife and migration patterns.

**Additional Benefits and Costs**

Adaptation will most likely entail significant costs for such items as increased flood protection facilities and greater fortification of buildings of all kinds.

**Feasibility Issues**

It is probably not feasible to move towns entirely out of floodplains. It will also be difficult to devise measures to improve adaptability to the increased numbers and severity of tornadoes.

**Status of Group Approval**

Approved

**Level of Group Support**

Unanimous

**Barriers to Consensus**

None

## CC-8. Participate in Regional and Multistate GHG Reduction Efforts

### Policy Description

Regional approaches undertaken in collaboration with partner states or other organizations can offer broader and more economically efficient opportunities to reduce GHG emissions across Iowa's economy. Iowa has already joined several organizations, including the Midwestern Greenhouse Gas Accord, the Midwestern Governors Energy Security and Climate Stewardship Platform, and the multistate Climate Registry initiatives. These developments should be continued and should form the basis for Iowa's own programs. To the extent that Iowa's needs may not be fully met by these initiatives, Iowa should consider developing supplemental or ancillary registry capacity or opportunity. (See CC-1.)

### Policy Design

#### Goals:

- Work to develop these regional programs so that Iowa's interests are protected, while meeting Iowa's goals of developing capacity to reduce the state's GHG emissions effectively.
- Ensure the cost-effective reduction of GHG emissions in a manner that maximizes public benefits, induces innovation in energy efficiency and sustainable energy technologies, and avoids inequitable impacts.
- Maximize economic and employment opportunities, while minimizing transitional job losses.
- Iowa needs to establish GHG reduction scenarios and time frames consistent with the other member states' own scenarios, help to develop a market-based and multisector cap-and-trade mechanism, and continue to develop other mechanisms and policies to achieve the proposed reduction scenarios.
- Establish links to other jurisdictions and systems to create economies of scale, increasing efficiency and diversity.
- Address the ability to integrate and potential actions taken by federal programs.

**Timing:** Iowa should move forward in the 2009 legislative session to address any needed regional initiatives associated with implementation of the Midwestern Regional GHG Accord.

The GHG Accord was signed on November 15, 2007. Various time lines within the Accord have a target completion of 30 months after the signature date.

The Energy Security and Climate Stewardship Platform for the Midwest was also signed on November 15, 2007. The dates mentioned in the Platform include 2012, 2015, 2020, 2025, 2030, and 2050.

**Parties Involved:** Currently, six states (Iowa, Illinois, Kansas, Michigan, Minnesota, and Wisconsin) and one Canadian province (Manitoba) are signatory to the Accord. In addition, three

other states (Indiana, Ohio, and South Dakota) have signed as observers to participate in regional cap-and-trade issues.

### **Implementation Mechanisms**

Iowa needs to work with other states through the Midwestern GHG Accord to develop and implement an approach to reducing GHG emissions within the region, recognizing that each state will have unique problems to address. These efforts should include consulting on a regional cap-and-trade policy, and/or a carbon tax system.

### **Related Policies/Programs in Place**

- The Midwestern Regional Greenhouse Gas Reduction Accord.
- The Energy Security and Climate Stewardship Platform for the Midwest.

### **Type(s) of GHG Reductions**

Not applicable.

### **Estimated GHG Savings and Net Costs or Cost Savings**

Not applicable.

### **Key Uncertainties**

Potential federal and/or regional program elements that will be forthcoming are uncertain.

### **Additional Benefits and Costs**

Costs will be associated with implementing the Midwestern Regional GHG Accord and any potential new federal programs. Reducing GHG emissions will have the ancillary benefit of improving Iowa's economy and energy security.

### **Feasibility Issues**

It is more difficult to tailor larger national or regional program elements to Iowa-specific needs.

### **Status of Group Approval**

Approved

### **Level of Group Support**

Unanimous

### **Barriers to Consensus**

None

**CC-9. Encourage the Creation of a Business-Oriented Organization to Facilitate Investment in Climate-Related Business Opportunities and to Share Information and Strategies, Recognize Successes, and Support Aggressive GHG Reduction Goals**

**Policy Description**

Numerous economic and business opportunities can arise from implementing a comprehensive GHG reduction strategy for Iowa. A variety of job creation possibilities are implicit in new approaches to transportation, land use, green construction, recycling and reuse, and energy-efficient products and services. The state should work with public and private entities to identify, promote, and finance these opportunities for economic development and job creation. Iowa should also work to keep existing green jobs in Iowa and prevent them from moving out of state.

The growth of the “green industry” has the potential to benefit low- to mid-skill workers who can no longer depend on traditional manufacturing jobs. Since green jobs require applied technical skills, they generally pay decent wages. Unlike blue-collar jobs, many green-collar jobs require local employees and cannot be outsourced.

Another component of economic development is the promotion of buying locally produced foods, goods, and products. Consumer support for the local economy helps sustain Iowa businesses, jobs, and tax base, while reducing the consumption of fuel (and CO<sub>2</sub> emissions) in the transportation of foods and products over great distances.

**Policy Design**

In Iowa, the opportunities for creating green jobs are numerous, including designing and constructing green buildings; weatherizing existing buildings; retrofitting older buildings with energy-efficient appliances and technologies; expanding the construction, maintenance, and operation of common-carrier and public transportation networks and systems; designing, constructing, and operating windmills, biomass generators, and solar collectors; and research and development of a wide array of new practices and technologies that can abate GHG production.

A business-oriented organization should be established or assigned responsibility to help promote these opportunities related to climate change in Iowa. Promotion of consumption of locally produced foods and goods will also strengthen Iowa's economy.

**Goals:** Targeted business promotion and job creation should be a part of Iowa’s effort to mitigate GHG emissions. Iowa should build upon its momentum to make every effort to establish itself as a leader in developing green industries.

OEI administers the Iowa Power Fund, a \$100 million effort over 4 years to support research, development, commercialization, and deployment of biofuels, renewable energy technologies, and energy-efficient technologies while seeking to cut GHG emissions. One criterion on which proposals for the Fund are judged is their ability to create economic opportunity in Iowa and future green collar jobs. OEI coordinates their efforts with the Iowa Department of Economic

Development (IDED), the State of Iowa Facilities Improvement Corporation, the Renewable Fuel Infrastructure Program, the Value-Added Agricultural Products and Processes Financial Assistance Program, the Enterprise Zone Program, and High-Quality Job Creation Program.

**Timing:** As soon as possible to build on OEI projects.

**Parties Involved:** Universities, IDED, Chambers of Commerce, energy utilities, existing green businesses and industries, energy conservation experts, and individual businesses across the state.

**Other:** None currently identified.

### Implementation Mechanisms

A group of Iowa experts from across the state and across disciplines should be assembled to develop a vision and strategies for developing and attracting businesses that will flourish in a carbon-constrained world. The group should be tasked with developing key criteria that will be used in evaluating potential business developments in Iowa. Sample criteria might include:

- Will the business benefit from the carbon-constrained economy?
- How will the potential business fare in a changing climate?
- Will the business be based upon locally available materials?
- Will the business be structured to allow reduction of commuting requirements for employees?
- Will the business be able to function in relation to existing businesses through the principles of Industrial Ecology?
- A GHG emission per dollar of product metric could be developed and used to scale economic assistance.

The group should be tasked with providing recommendations to the Iowa legislature for the 2010 session.

### Related Policies/Programs in Place

Iowa Power Fund, IDED programs, university research.

### Type(s) of GHG Reductions

Not applicable.

### Estimated GHG Savings and Net Costs or Cost Savings

Not applicable.

**Key Uncertainties**

There is uncertainty about whether, and if so, who, will lead this initiative on behalf of the business community, and how much business participation can be counted upon. There is also uncertainty about the future of biofuels.

**Additional Benefits and Costs**

This endeavor could create more opportunities for new technology development. There can be synergy among companies working on these types of similar ventures. While economic and employment opportunities should be significant, significant costs will also most likely be associated with implementation of some of the CAP elements. There is a significant promise that development of green cellulosic crops could spur Iowa's economy.

**Feasibility Issues**

Restructuring and retraining the work force to implement a new reduced-carbon energy economy will be challenging. Iowa will need to gauge the cost-effectiveness of selected solutions along the way.

**Status of Group Approval**

Approved

**Level of Group Support**

Unanimous

**Barriers to Consensus**

None