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Agriculture, Forestry, and Waste Management (AFW) Subcommittee

Summary List of Draft Priority Policy Options for Analysis

Draft Option #	Draft Policy Option Name	Straw Proposal Volunteers
AFW-1	Nutrient and Water Management	TBD
AFW-2	Wetlands Protection and Drainage Management	TBD
AFW-3	Expanded Use of Agriculture and Forestry Biomass Feedstocks for Electricity, Heat or Steam Production	TBD
AFW-4	Encourage Large-Scale Manure Management/Methane Capture & Utilization	TBD
AFW-5	Land Management to Promote Sequestration Benefits	TBD
AFW-6	Cellulosic Fuel Incentives	TBD
AFW-7	Improved On-Farm (or First Point of Purchase) Energy Use and Efficiency	TBD
AFW-8	Front End Waste Management Technologies	TBD
AFW-9	Landfill Methane Energy Programs	TBD

Sample Draft Policy Option Template

AFW-1 Nutrient and Water Management

Policy Description

Demonstrate and encourage the implementation of GHG-beneficial management practices including: nutrient and soil management techniques to lower N_2O emissions and increase soil carbon retention; carbon mapping; and various other possibilities offered through advanced technology.

Improve the efficiency of fertilizer use and other nitrogen-based soil amendments through implementation of management practices, including advanced technologies for commercial fertilizer application and offsetting commercial fertilizer use with manure. Better nutrient utilization can lead to lower nitrous oxide emissions from run-off and lower lifecycle GHG emissions associated with commercial fertilizer manufacture and transport.

Policy Design

Goals: TBD

Examples:

Increase fertilizer application efficiency by X% by 2020

- **Timing:**
- **Parties Involved:**
- **Other:**

Implementation Mechanisms

TBD

Related Policies/Programs in Place

Types(s) of GHG Reductions

- *N_2O: reductions occur when nitrogen run-off and leaching are reduced, which leads to the formation and emission of N_2O.*
- *CO_2: reductions occur as soil carbon levels in crop soils are increased above business as usual levels. Increasing the levels of carbon in soils indirectly sequesters carbon from the atmosphere.*

Estimated GHG Reductions and Net Costs or Cost Savings

TBD – [CCS should provide a worksheet and other reference material as needed for transparency]

- **Data Sources: [**TBD by CCS on subcommittee approval]
- **Quantification Methods: [e.g.** Full life-cycle analysis with supply/demand equilibrium adjustments on subcommittee approval]
- **Key Assumptions: [**TBD, as needed on subcommittee approval]

Key Uncertainties

TBD – [as needed and approved by the subcommittees]

Additional Benefits and Costs

TBD – [as needed and approved by the subcommittees]

Subcommittee Suggestion:

Feasibility Issues

TBD – [as needed and approved by the subcommittees]

Status of Group Approval

Pending –

Level of Group Support

TBD – [blank until ICCAC meeting #5]

Barriers to Consensus

TBD – [blank until final vote by the ICCAC]

Sample Draft Policy Option Template

AFW-2 Wetlands Protection and Drainage Management

Policy Description

Research should be conducted and programs should be adopted to identify and eliminate threats to the vast carbon pools currently stored in lands that hold high levels of soil organic carbon, such as wetlands. Efforts are needed to protect these carbon reservoirs from inappropriate drainage.

Improve drainage on agricultural lands to prevent ponding, which could lead to anaerobic soils and GHG emissions (methane).

Policy Design

Goals: TBD

Examples:

By 2020, reduce the loss of wetlands by XX%.

Reduce ponding on agriculture lands by XX% by 2020.

- **Timing:**
- **Parties Involved:**
- **Other:**

Implementation Mechanisms

TBD –

Related Policies/Programs in Place

Types(s) of GHG Reductions

- ***CO_2:*** *Conservation of wetlands helps maintain the ability of the land to sequester carbon in soil and biomass.*
- ***CH_4:*** *Improved drainage reduces anaerobic decomposition, thereby preventing methane creation.*

Estimated GHG Reductions and Net Costs or Cost Savings

TBD – [CCS should provide a worksheet and other reference material as needed for transparency]

- **Data Sources: [**TBD by CCS on subcommittee approval]
- **Quantification Methods: [e.g.** Full life-cycle analysis with supply/demand equilibrium adjustments on subcommittee approval]
- **Key Assumptions: [**TBD, as needed on subcommittee approval]

Key Uncertainties

TBD – [as needed and approved by the subcommittees]

Additional Benefits and Costs

TBD – [as needed and approved by the subcommittees]

Feasibility Issues

TBD – [as needed and approved by the subcommittees]

Status of Group Approval

Pending –

Level of Group Support

TBD – [blank until ICCAC meeting #5]

Barriers to Consensus

TBD – [blank until final vote by the ICCAC]

Sample Draft Policy Option Template

AFW-3 Expanded Use of Agriculture and Forestry Biomass Feedstocks for Electricity, Heat or Steam Production

Policy Description

Increase the amount of biomass (including biomass from forest sources) available for generating electricity and displacing the use of fossil energy sources. Local electricity or steam production yields greatest net energy payoff. Increase the amount of energy crop production and utilization through the planning of energy purpose crops for generating electricity and displacing the use of fossil energy sources.

Note that this option is focused on the supply-side aspects of promoting biomass fuel, with an emphasis on the development of feedstocks, collection, processing and transport technologies. The demand-side aspects of renewable fuels (including biomass use) are being addressed through the Transportation and Land Use subcommittee through options in the CRE TWG (Generation Portfolio Standards; Technology-Focused Initiatives).

Policy Design

Goals: TBD

Examples:

Increase biomass use for electricity, steam, and heat generation to utilize XX% of available in-state biomass by 2020.

- **Timing:**
- **Parties Involved:**
- **Other:**

Implementation Mechanisms

TBD – [CCS drafts based on subcommittee inputs; this can be developed as they go along, and can start early or late as they prefer; the level of detail can vary on subcommittee approval]

Related Policies/Programs in Place

Alternative Energy Law (Iowa's Renewable Portfolio Standard)—*Iowa requires its two investor-owned utilities—MidAmerican Energy and Alliant Energy Interstate Power and Light—to contract for a combined total of 105 megawatts (MW) of their generation from renewable-energy resources.*

Fuel Mix Disclosure—*Iowa's rate-regulated electric utilities must report annually to customers the percentage mix of fuel and energy used to produce electricity. The percentages for renewables must further be broken down into percentages of electricity generated by wind, solar, hydropower, biomass, and other resources. Each utility's annual report must also include an estimate of sulfur dioxide, nitrogen oxides, and carbon dioxide emissions for each fuel and resource.*

Energy Research Grants—*The Iowa Energy Center provides grants for energy research on topics that have strong relevance to Iowa.*

Types(s) of GHG Reductions

- ***CO_2, N_2O, CH_4:*** *Displaces emissions from fossil fuel combustion.*

Estimated GHG Reductions and Net Costs or Cost Savings

TBD – [CCS should provide a worksheet and other reference material as needed for transparency]

- **Data Sources: [**TBD by CCS on subcommittee approval]
- **Quantification Methods: [e.g.** Full life-cycle analysis with supply/demand equilibrium adjustments on subcommittee approval]
- **Key Assumptions: [**TBD, as needed on subcommittee approval]

Key Uncertainties

TBD – [as needed and approved by the subcommittees]

Additional Benefits and Costs

TBD – [as needed and approved by the subcommittees]

Feasibility Issues

TBD – [as needed and approved by the subcommittees]

Status of Group Approval

Pending –

Level of Group Support

TBD – [blank until ICCAC meeting #5]

Barriers to Consensus

TBD – [blank until final vote by the ICCAC]

Sample Draft Policy Option Template

AFW-4 Encourage Large-Scale Manure/Methane Management Capture Utilization

Policy Description

Reduce methane emissions from livestock manure by installing anaerobic digester systems at Iowa concentrated animal feeding operations (CAFOs). Methane captured from the digesters is used to create heat or power, which offsets fossil fuel-based energy production and the associated greenhouse gas GHG emissions. This option is focused on implementing these projects at the large-scale level (e.g. community-based systems).

Reduce GHG emissions associated with manure handling and storage. Potential practices include but are not limited to manure composting (to reduce methane emissions) and improved methods for application to fields (for reduced nitrous oxide [N_2O] emissions). Application improvements include incorporation into soil instead of surface spray/spreading.

Policy Design

Goals: TBD

Examples:

By 2020, utilize XX% of available methane from livestock manure for renewable electricity, heat and steam generation.

Apply improved manure handling and storage practices on XX% of manure generated by 2020

- **Timing:**
- **Parties Involved:**
- **Other:**

Implementation Mechanisms

TBD – [CCS drafts based on subcommittee inputs; this can be developed as they go along, and can start early or late as they prefer; the level of detail can vary on subcommittee approval]

Related Policies/Programs in Place

Alternate Energy Revolving Loan Program (AERLP)—*The Iowa Energy Center provides zero-percent interest loans for up to half of the project cost, up to a maximum of $250,000.* *http://www.energy.iastate.edu/AERLP/index.htm*

Energy Research Grants—*The Iowa Energy Center provides grants for energy research on topics that have strong relevance to Iowa.* *http://www.energy.iastate.edu/Funding/gp-research.htm*

Alternative Fuel Production Loans—*The Value-Added Agricultural Products and Processes Financial Assistance Program offers a combination of forgivable and traditional low-interest loans for business projects involving the production of biomass or alternative fuels.* *http://www.iowalifechanging.com/business/vaapfap.html*

Iowa DNR Anaerobic Digestion Outreach Program—*Recognizing the enormous opportunity for the wide-scale implementation of farm-scale and community-based anaerobic digester systems in Iowa, the Iowa Department of Natural Resources Energy and Waste Management Bureau set about promoting the digester concept to Iowa Communities having large concentrations of livestock production, large volumes of organic wastes, and large energy users. For more information, contact Allan Goldberg at 515-281-8912 or at allan.goldberg@dnr.iowa.gov.*

Types(s) of GHG Reductions

- *CO_2, N_2O, CH_4: Displaces emissions from fossil fuel combustion.*
- *CH_4: Capture and utilization or preventing the creation of methane.*
- *N_2O: reductions occur when nitrogen run-off and leaching are reduced, which leads to the formation and emission of N_2O.*

Estimated GHG Reductions and Net Costs or Cost Savings

TBD – [CCS should provide a worksheet and other reference material as needed for transparency]

- **Data Sources: [**TBD by CCS on subcommittee approval]
- **Quantification Methods: [e.g.** Full life-cycle analysis with supply/demand equilibrium adjustments on subcommittee approval]
- **Key Assumptions: [**TBD, as needed on subcommittee approval]

Key Uncertainties

TBD – [as needed and approved by the subcommittees]

Additional Benefits and Costs

TBD – [as needed and approved by the subcommittees]

Feasibility Issues

TBD – [as needed and approved by the subcommittees]

Status of Group Approval

Pending –

Level of Group Support

TBD – [blank until ICCAC meeting #5]

Barriers to Consensus

TBD – [blank until final vote by the ICCAC]

Sample Draft Policy Option Template

AFW-5 Land Management to Promote Sequestration Benefits

Policy Description

Convert marginal agricultural land used for annual crops to permanent cover such as grassland/rangeland, orchard, or forest where the soil carbon and/or carbon in biomass is higher under the new land use. Adopt mechanisms to prevent theses acres from either returning to conventionally tilled production or to suburban/urban development including maintenance of Conservation Reserve Program (CRP) lands.

Heavy grazing can cause significant soil disturbance and result in carbon losses from soils. Rotational grazing where animals are moved from field to field on a regular basis can reduce soil disturbance, improve plant vigor and enhance soil carbon levels.

On cultivated lands, the amount of carbon stored in the soil can also be increased by the adoption of practices such as conservation and no-till cultivation. Reducing summer fallow and increasing winter cover crops are complementary practices that reduce the need for conventional tillage. By reducing mechanical soil disturbance, these practices reduce the oxidation of soil carbon compounds and allow more stable aggregates to form. Other benefits include reduced wind and water erosion, reduced fuel consumption, and improved wildlife habitat.

Establish forests on land that has not historically been forested (e.g., afforestation of agricultural land) and promote forest cover and associated carbon stocks by regenerating or establishing forests in areas with little or no present forest cover ("reforestation"). Maintain and improve the health and longevity of trees in urban and residential areas to protect and enhance the carbon stored in tree biomass. Indirect emissions reductions may also occur by reducing heating and cooling needs as a result of planting shade trees.

Policy Design

Goals: TBD

Examples:

By 2020, convert XX acres of marginal agricultural land to higher sequestration permanent cover (including grassland, rangeland, orchard, or forest).

Apply conservation grazing practices including rotational grazing to XX acres of farmland by 2020.

Conservation practices (such as no-till, crop rotation, or other cropping management practices that achieve similar soil carbon benefits) will account for XX% of all annual crop production in Iowa.

Increase permanent forestland in the state by XX acres.

Increase the canopy cover of urban forest in Iowa communities by XX%.

- **Timing:**
- **Parties Involved:**
- **Other:**

Implementation Mechanisms

TBD – [CCS drafts based on subcommittee inputs; this can be developed as they go along, and can start early or late as they prefer; the level of detail can vary on subcommittee approval]

Related Policies/Programs in Place

Types(s) of GHG Reductions

- *CO_2: Increase the sequestration of carbon, as well as preventing carbon currently stored in Iowa's forests and farm land from being released. Reductions also occur as soil carbon levels in crop soils are increased above business as usual levels. Increasing the levels of carbon in soils indirectly sequesters carbon from the atmosphere.*

Estimated GHG Reductions and Net Costs or Cost Savings

TBD – [CCS should provide a worksheet and other reference material as needed for transparency]

- **Data Sources: [**TBD by CCS on subcommittee approval]
- **Quantification Methods: [e.g.** Full life-cycle analysis with supply/demand equilibrium adjustments on subcommittee approval]
- **Key Assumptions: [**TBD, as needed on subcommittee approval]

Key Uncertainties

TBD – [as needed and approved by the subcommittees]

Additional Benefits and Costs

TBD – [as needed and approved by the subcommittees]

Feasibility Issues

TBD – [as needed and approved by the subcommittees]

Status of Group Approval

Pending –

Level of Group Support

TBD – [blank until ICCAC meeting #5]

Barriers to Consensus

TBD – [blank until final vote by the ICCAC]

Sample Draft Policy Option Template

AFW-6 Cellulosic Fuel Incentives

Policy Description

Promote research and production of sustainable in-state fuels derived from cellulose (biomass) to displace the use of conventional petroleum-based fuels. Promote the in-state development of cellulosic feedstocks (including perennials) that are able to be utilized for the production of cellulosic fuels. Promote research into conversion technologies, such as thermo-chemical Fischer-Tropsch processes and enzymatic conversion, to facilitate their development.

Promote cellulosic biofuel production systems that improve the embedded energy content, life-cycle, and carbon profile of biofuels. Focus on plant material feedstocks that favor energy production and are carbon neutral or negative and have multiple other positive environmental benefits, such as maintaining carbon sequestration potential and soil productivity, and decreasing water and fossil fuel inputs in their production. This could help provide a strong economic market within the state and reduce GHG emissions through avoided fossil fuel consumption.

Note that this option is focused on the supply-side aspects of promoting biofuels, with an emphasis on the development of feedstocks and production technologies. The demand-side aspects of renewable fuels (including cellulosic biofuels) are being addressed through the Transportation and Land Use subcommittee through TLU-8.

Policy Design

Goals: TBD

Example:

Increase in-state cellullosic fuel production to offset XX% of fossil-based gasoline and/or XX% of fossil-based diesel consumption by 2020.

- **Timing:**
- **Parties Involved:**
- **Other:**

Implementation Mechanisms

TBD – [CCS drafts based on subcommittee inputs; this can be developed as they go along, and can start early or late as they prefer; the level of detail can vary on subcommittee approval]

Related Policies/Programs in Place

Types(s) of GHG Reductions

- ***CO_2:*** *Lifecycle emissions are reduced to the extent that biofuels are produced with lower embedded fossil-based carbon than conventional (fossil) fuel. Feedstocks used for producing biofuels can be made from crops or other biomass, which contain carbon sequestered during photosynthesis (e.g., biogenic or short-term carbon).*

Estimated GHG Reductions and Net Costs or Cost Savings

TBD – [CCS should provide a worksheet and other reference material as needed for transparency]

- **Data Sources: [**TBD by CCS on subcommittee approval]
- **Quantification Methods: [e.g.** Full life-cycle analysis with supply/demand equilibrium adjustments on subcommittee approval]
- **Key Assumptions: [**TBD, as needed on subcommittee approval]

Key Uncertainties

TBD – [as needed and approved by the subcommittees]

Additional Benefits and Costs

TBD – [as needed and approved by the subcommittees]

Feasibility Issues

TBD – [as needed and approved by the subcommittees]

Status of Group Approval

Pending –

Level of Group Support

TBD – [blank until ICCAC meeting #5]

Barriers to Consensus

TBD – [blank until final vote by the ICCAC]

Sample Draft Policy Option Template

AFW-7 Improved On-Farm (or First Point of Purchase) Energy Use and Efficiency

Policy Description

Renewable energy can be produced and used on-site at agriculture operations. For example, installation of solar or wind power, use of hydro-powered generators for irrigation, and converting diesel farm equipment to liquid natural gas/compressed natural gas (LNG/CNG) or hybrid technology will reduce carbon dioxide emissions by displacing the use of fossil-based fuels. The use of energy efficient products should also be promoted. This could include improved grain dryers, heat exchangers (dairy), electric motors, and energy efficient building design.

Policy Design

Goals: TBD

Examples:

Increase renewable energy use at agriculture operations by XX% by 2020.

Increase energy efficiency of on-farm operations by XX% by 2020.

- **Timing:**
- **Parties Involved:**
- **Other:**

Implementation Mechanisms

TBD – [CCS drafts based on subcommittee inputs; this can be developed as they go along, and can start early or late as they prefer; the level of detail can vary on subcommittee approval]

Related Policies/Programs in Place

Types(s) of GHG Reductions

- ***CO_2:*** *Improved efficiency can reduce electricity and fuel consumption and the associated GHGs.*

Estimated GHG Reductions and Net Costs or Cost Savings

TBD – [CCS should provide a worksheet and other reference material as needed for transparency]

- **Data Sources: [**TBD by CCS on subcommittee approval]

- **Quantification Methods: [e.g.** Full life-cycle analysis with supply/demand equilibrium adjustments on subcommittee approval]
- **Key Assumptions: [**TBD, as needed on subcommittee approval]

Key Uncertainties

TBD – [as needed and approved by the subcommittees]

Additional Benefits and Costs

TBD – [as needed and approved by the subcommittees]

Feasibility Issues

TBD – [as needed and approved by the subcommittees]

Status of Group Approval

Pending –

Level of Group Support

TBD – [blank until ICCAC meeting #5]

Barriers to Consensus

TBD – [blank until final vote by the ICCAC]

Sample Draft Policy Option Template

AFW-8 Front End Waste Management Technologies

Policy Description

Reduce the volume of waste from residential, commercial, and government sectors through programs that reduce the generation of wastes. Reduction of generation at the source reduces both landfill emissions and upstream production emissions.

Increase recycling or re-use of waste in order to limit GHG emissions associated with landfill methane generation and with the production and transport of products/packaging from virgin materials (noting that different recycled materials will exhibit different costs and benefits on a life-cycle basis). Increase recycling programs, create new recycling programs, provide incentives for recycling construction materials, develop markets for recycled materials, and increase average participation/recovery rates for all existing recycling programs.

Increase organics management programs, such as composting, in order to reduce GHG emissions associated with landfilled organic waste.

Policy Design

Goals: TBD

Examples:

Source Reduction: Reduce waste stream by XX% by 2020. or Achieve a 0% per capita increase by 2020

Re-Use and Recycling: Increase recycling stream to XX% by 2020

Organics Management: Increase composting rates to XX% by 2020.

- **Timing:**
- **Parties Involved:**
- **Other:**

Implementation Mechanisms

TBD – [CCS drafts based on subcommittee inputs; this can be developed as they go along, and can start early or late as they prefer; the level of detail can vary on subcommittee approval]

Related Policies/Programs in Place

Waste Management Programs—*The State of Iowa runs several programs to promote waste reduction, recycling, and composting. These programs include Iowa DNR's Solid Waste*

Alternatives Program, Pollution Prevention Services Program, and Iowa Waste Exchange, as well as Iowa Waste Reduction Center at the University of Northern Iowa.

Landfill Diversion Goals—*The State of Iowa adopted the goal of diverting 50% of waste from landfills by the year 2000 from year 1988 levels.*

Types(s) of GHG Reductions

- ***CO_2:*** *Upstream Energy Use Reductions – The energy and GHG intensity of manufacturing a product is generally less using recycled feedstocks than from using virgin feedstocks.*
- ***CH_4:*** *Diverting biodegradable wastes from landfills will result in a decrease in methane gas releases from landfills.*

Estimated GHG Reductions and Net Costs or Cost Savings

TBD – [CCS should provide a worksheet and other reference material as needed for transparency]

- **Data Sources: [**TBD by CCS on subcommittee approval]
- **Quantification Methods: [e.g.** Full life-cycle analysis with supply/demand equilibrium adjustments on subcommittee approval]
- **Key Assumptions: [**TBD, as needed on subcommittee approval]

Key Uncertainties

TBD – [as needed and approved by the subcommittees]

Additional Benefits and Costs

TBD – [as needed and approved by the subcommittees]

Feasibility Issues

TBD – [as needed and approved by the subcommittees]

Status of Group Approval

Pending –

Level of Group Support

TBD – [blank until ICCAC meeting #5]

Barriers to Consensus

TBD – [blank until final vote by the ICCAC]

Sample Draft Policy Option Template

AFW-9 Landfill Methane Energy Programs

Policy Description

Use the renewable energy within landfills gas (methane) to make electric power, space heat, or liquefied natural gas. Methane gas generation by landfills is a GHG reduction strategy that may benefit from a cap and trade system, encouraging landfills to install flares at a minimum and possibly achieve electric generation if the economic incentives are sufficient.

Policy Design

Goals: TBD

Examples

Increase the number of landfills recovering methane as an energy source, such that XX% of the landfill gas being generated is controlled by 2020.

- **Timing:**
- **Parties Involved:**
- **Other:**

Implementation Mechanisms

TBD – [CCS drafts based on subcommittee inputs; this can be developed as they go along, and can start early or late as they prefer; the level of detail can vary on subcommittee approval]

Related Policies/Programs in Place

Methane Gas Conversion Property Tax Exemption—*Under Iowa's Methane Gas Conversion Property Tax Exemption, property used for methane gas collection and conversion into energy and connected with, or in conjunction with, a publicly owned sanitary landfill, is exempt from property tax. If other fuels are burned as well, the exemption is equal to the ratio of methane in the overall fuel mix.*

Types(s) of GHG Reductions

- ***CO_2, N_2O, CH_4:*** *Displaces emissions from fossil fuel combustion.*
- ***CH_4:*** *Methane reductions via collection and control (via flaring, or preferentially via energy utilization).*

Estimated GHG Reductions and Net Costs or Cost Savings

TBD – [CCS should provide a worksheet and other reference material as needed for transparency]

- **Data Sources: [**TBD by CCS on subcommittee approval]
- **Quantification Methods: [e.g.** Full life-cycle analysis with supply/demand equilibrium adjustments on subcommittee approval]
- **Key Assumptions: [**TBD, as needed on subcommittee approval]

Key Uncertainties

TBD – [as needed and approved by the subcommittees]

Additional Benefits and Costs

TBD – [as needed and approved by the subcommittees]

Feasibility Issues

TBD – [as needed and approved by the subcommittees]

Status of Group Approval

Pending –

Level of Group Support

TBD – [blank until ICCAC meeting #5]

Barriers to Consensus

TBD – [blank until final vote by the ICCAC]