

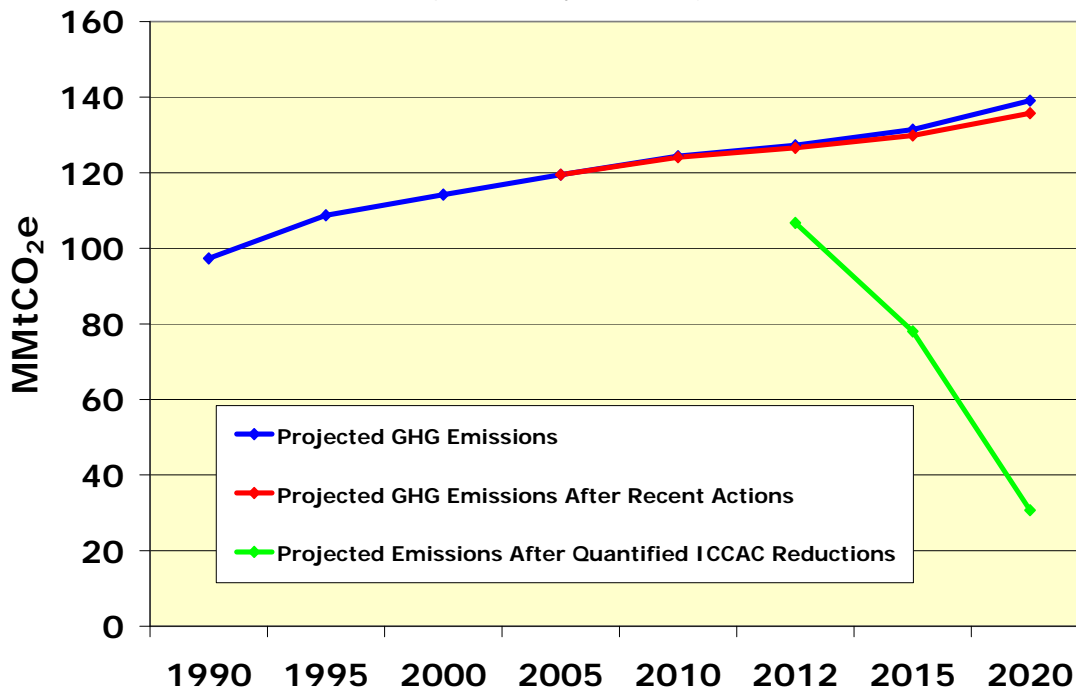


## Iowa Climate Change Action Plan Summary

In 2007 and 2008 the Iowa legislature enacted laws creating the [Iowa Climate Change Advisory Council \(ICCAC\)](#) tasking it with developing scenarios “to reduce statewide greenhouse gas emissions by 50% and 90% by 2050.” The ICCAC was led by Chairman, Professor Jerald Schnoor of the Center for Global and Regional Environmental Research at the University of Iowa and Vice Chair, Frank Cownie, the Mayor of Des Moines. The Council – which included 23 members from business, industry, environmental groups, government, academia and more – was assisted by more than 40 members of technical Subcommittees.

Following a year of deliberations, the Council presented 56 policies – 76% by unanimous or super majority vote (support by 80% or more). Of these 56 policy options, 38 were analyzed and quantified to estimate their greenhouse gas (GHG) reductions and costs. These 38 quantified policies have the cumulative effect of reducing emissions by about 20 million metric tons of carbon dioxide equivalent (MMtCO<sub>2</sub>e) in 2012 and 105 (MMtCO<sub>2</sub>e) in 2020.

**GHG Reduction Potential from Iowa’s Recent and Proposed Actions**  
(CCS analysis, 2009)



MMtCO<sub>2</sub>e = million metric tons of carbon dioxide equivalent; GHG = greenhouse gas;  
ICCAC = Iowa Climate Change Advisory Council.

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[http://www.climatestrategies.us/CCS\\_events.cfm](http://www.climatestrategies.us/CCS_events.cfm)

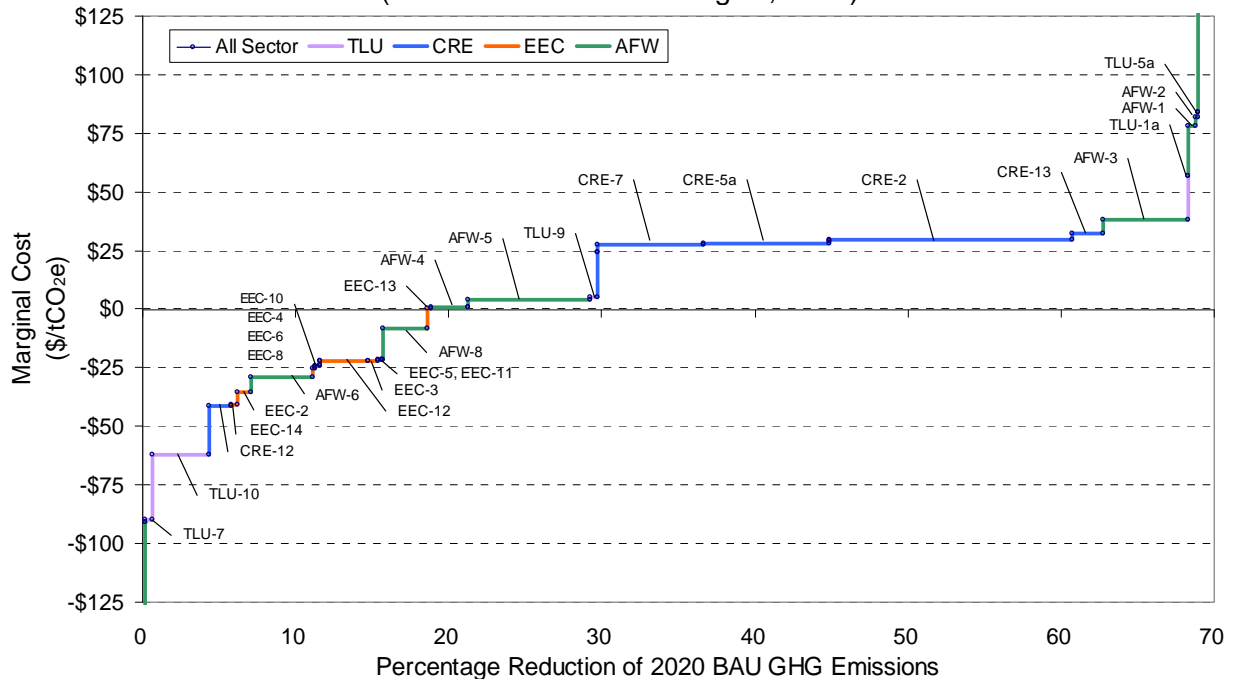
The [Center for Climate Strategies](#) (CCS) provided facilitation and technical support to the Council and its Subcommittees. Members addressed policy development for all sectors of the Iowa economy. These include:

- [Agriculture, Forestry and Waste Conservation](#)
- [Clean and Renewable Energy \(Heat and Power Generation\)](#)
- [Energy Conservation and Efficiency \(Heat and Power Consumption\)](#)
- [Transportation and Land Use Improvements](#)

Iowa has a large percentage of emissions from agricultural sources, 23% compared to the national average of under 7%. Of this, manure accounts for nearly 25% of Iowa GHGs.

The cost curve below shows the cost effectiveness of many of the specific policy options in these sectors (represented by each color coded and labeled line segment) in terms of their savings or costs and their contribution to reducing GHGs.

**Estimated Costs and Savings for Iowa Climate Mitigation Actions;  
 Economy-wide Stepwise Marginal Cost Curve of Iowa, 2020**  
 (Center for Climate Strategies, 2008)



BAU = business as usual; GHG = greenhouse gas; tCO<sub>2</sub>e = metric tons of carbon dioxide equivalent; AFW = Agriculture, Forestry, and Waste Management; EEC = Energy Efficiency and Conservation; TLU = Transportation and Land Use; CRE = Clean and Renewable Energy. Negative values represent net cost savings and positive values represent net costs associated with the policy option. Note: Results have been adjusted to remove overlaps between policies.

The [Iowa Climate Report](#) is one of [30 such state plans](#) that have been completed or are underway by U.S. states. It includes an emissions target, and a comprehensive set of sector-based policies and measures. Its design is consistent with the national climate proposal passed in the [U.S. House of Representatives](#) and supported by the Administration.

## Summary Tables of Sector-Based Recommendations

The tables below list Iowa's recommended policies by sector/Subcommittee and show results of analyses conducted by CCS according to specifications by Subcommittees. Some policies were not quantified due to data limitations or other factors.

**Key to Table Acronyms:** 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, N/Q = not quantified; CO<sub>2</sub>e/MWh = carbon dioxide equivalents per megawatt-hour

**Note:** Negative dollar values indicate *cost savings*. The cost (savings) shown are calculated in terms of net present value in constant 2006 dollars, using a 5% annual real discount rate for the period 2008 through 2020. Capital investments are represented in terms of levelized or amortized costs through 2020. The numbering of policies does not reflect prioritization among the options. Gaps in Policy Numbers reflect policies that were merged with other options, dropped from the priority list for analysis, or did not win majority approval.

### Agriculture, Forestry, and Waste Management Policy Options

Policy No.	Agriculture, Forestry, and Waste Management Policy Option	GHG Reductions (MMtCO <sub>2</sub> e)			Net Present Value 2009–2020 (Million \$)	Cost-Effectiveness (\$/tCO <sub>2</sub> e)
		2012	2020	Total 2009–2020		
AFW-1	Nutrient Management					
	Increase Efficiency of Fertilizer	0.11	0.53	3.0	–\$103	–\$34
	Seasonally Flooded Areas	0.002	0.009	0.05	\$10	\$194
	Improved Nutrient Distribution	0.02	0.1	0.55	\$373	\$693
AFW-2	Wetlands and Drainage	0.01	0.16	0.57	\$120	\$218
AFW-3	Expanded Use of Agriculture and Forestry Biomass Feedstocks for Electricity, Heat, or Steam Production	4.4	20	113	\$4,281	\$38
AFW-4	Encourage Large-Scale Manure/Methane Management Capture Utilization					
	Methane Management Capture Utilization	0.8	3	17	\$63	\$4
	Manure Management	0.2	0.7	4.6	–\$38	–\$8
AFW-5	Land Management to Promote Sequestration Benefits					
	Conservation Tillage	2.9	9	56	–\$6	–\$0.1
	Agriculture Land Conversion	0.1	0.4	2.6	\$199	\$76
	Conservation Grazing	0.1	0.3	1.7	–\$116	–\$67
	Afforestation	0.2	0.6	4.1	\$216	\$53
	Unmanaged Grazed Forested Land	0.3	0.8	5.5	\$93.7	\$17
	Urban Forestry	0.1	0.4	2.4	–\$99	–\$41
AFW-6	Cellulosic Biofuel*	2.0	9.8	49	–\$1,410	–\$29
AFW-7	Improved On-Farm (or First Point of Purchase) Energy Use and Efficiency					
	Renewable Energy	0.02	0.08	0.5	\$23	\$51

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Policy No.	Agriculture, Forestry, and Waste Management Policy Option	GHG Reductions (MMtCO <sub>2</sub> e)			Net Present Value 2009–2020 (Million \$)	Cost-Effectiveness (\$/tCO <sub>2</sub> e)
		2012	2020	Total 2009–2020		
	Energy Efficiency	0.2	0.9	5.9	–\$610	–\$104
AFW-8	Waste Management Strategies	1.5	4.1	26.5	–\$220	–\$8
AFW-9	Landfill Methane Energy Programs	0.2	0.8	4.8	\$4	\$0.8
	<b>Sector Total After Adjusting for Overlaps</b>	<b>11</b>	<b>37</b>	<b>233</b>	<b>\$2,139</b>	<b>\$9</b>
	<b>Reductions From Recent Actions</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>\$0.0</b>	<b>\$0.0</b>
	<b>Sector Total Plus Recent Actions</b>	<b>11</b>	<b>37</b>	<b>233</b>	<b>\$2,139</b>	<b>\$9</b>

\* Note that the costs/savings of this option include a \$1.01/gallon federal subsidy for cellulosic ethanol.

### Clean and Renewable Energy Policy Options

Policy No.	Clean & Renewable Energy Policy Option	GHG Reductions (MMtCO <sub>2</sub> e)			Net Present Value 2009–2020 (Million \$)	Cost / ton (\$/tCO <sub>2</sub> e)	Change in Generation Cost in 2020 \$/MWh*
		2012	2020	Total 2009–2020			
CRE-1	Education	<i>Not Quantified</i>					
CRE-2	Technology Initiatives, Including Renewables	4.7	33.4	192.6	\$5,653	\$29.4	\$25.7
CRE-3	MGA Cap and Trade, Including Offsets To Promote Renewables	<i>Not Quantified</i>					
CRE-4	Decarbonization Fund	2.2	11.4	74.1	\$316	\$4.3	\$3.1
CRE-5	Performance Standards (50% Reduction by 2050)	4.9	11.4	95.4	\$2,650.6	\$27.8	\$7.3
CRE-6	Voluntary GHG Commitments	<i>Not Quantified</i>					
CRE-7	Policies Related to Nuclear Power	0.0	9.7	9.7	\$268	\$27.6	\$4.5
CRE-8	Support for Grid-Based Renewable Energy & Development (MGA Target of 20% of retail sales by 2020)	0.0	2.3	4.3	\$93.4	\$21.8	\$1.5
CRE-9	Transmission System Upgrading	<i>Not Quantified</i>					
CRE-10	R&D for Emerging Technologies and Corresponding Incentives	<i>Not Quantified</i>					
CRE-11	Distributed Generation/Co-Generation	0.0	0.1	0.5	\$14	\$29.1	\$0.1
CRE-12	Combined Heat and Power	0.3	2.1	13.6	–\$564.3	\$41.4	\$0.0
CRE-13	Pricing Strategies To Promote Renewable Energy and/or CHP	1.2	5.6	35	\$1,128	\$32.1	\$4.7
	<b>Sector Total After Adjusting for Overlaps</b>	<b>6</b>	<b>48</b>	<b>233</b>	<b>\$5,921</b>	<b>\$25</b>	
	<b>Reductions From Recent Actions</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
	<b>Sector Total Plus Recent Actions</b>	<b>6</b>	<b>48</b>	<b>233</b>	<b>\$5,921</b>	<b>\$25</b>	

### Energy Efficiency and Conservation Policy Options

Policy No.	Energy Efficiency and Conservation Policy Option	GHG Reductions (MMtCO <sub>2</sub> e)			Net Present Value 2009–2020 (Million \$)	Cost/Ton (\$/tCO <sub>2</sub> e)
		2012	2020	Total 2009–2020		
EEC-1	Consumer Education Programs	<i>Not quantified</i>				
EEC-2	Demand-Side Management (DSM)/Energy Efficiency Programs for Natural Gas	0.08	1.24	5.43	–\$191.77	–\$35.29
EEC-3	Financial Mechanisms for Energy Efficiency	1.62	6.11	36.81	–\$805.05	–\$21.87
EEC-4	Improved Building Codes for Energy Efficiency	0.05	0.40	1.89	–\$46.27	–\$24.44
EEC-5	Incentive Mechanisms for Achieving Energy Efficiency	0.35	3.29	16.33	–\$350.79	–\$21.48
EEC-6	Promotion and Incentives for Improved Design and Construction in the Private Sector	0.00	0.12	0.46	–\$11.36	–\$24.57
EEC-7	Training and Education for Builders and Contractors	<i>Not quantified</i>				
EEC-8	Focus on Specific Residential Market Segments	0.09	0.98	4.83	–\$122.53	–\$25.37
EEC-9	Midwestern Governors Association Energy Security and Climate Stewardship Platform	0.13	4.13	17.14	–\$375.69	–\$21.92
EEC-10	Energy Management Training/Training of Building Operators	0.10	1.29	5.48	–\$129.49	–\$23.63
EEC-11	Rate Structures and Technologies To Promote Reductions	0.04	0.21	1.20	–\$25.73	–\$21.45
EEC-12	Demand-Side Management (DSM)/Energy Efficiency Programs for Electricity	0.39	4.38	20.33	–\$444.81	–\$21.88
EEC-13	Government Lead by Example: Improved Design, Construction, and Energy Operations in New and Existing State and Local Government Buildings	0.08	0.36	1.97	1.04	0.53
EEC-14	More Stringent Appliance Efficiency Standards	0.94	2.20	17.33	–\$708.15	–\$40.85
	<b>Sector Total After Adjusting for Overlaps</b>	<b>1.1</b>	<b>8.6</b>	<b>43.2</b>	<b>–\$1,064.5</b>	<b>–\$24.7</b>
	<b>Reductions From Recent Actions: EISA (2007) and Executive Orders #6 and 41</b>	<b>0.44</b>	<b>1.42</b>	<b>9.19</b>		
	<b>Sector Total Plus Recent Actions</b>	<b>1.6</b>	<b>10.0</b>	<b>52.3</b>		

EISA = Energy Independence and Security Act of 2007.

Note: Existing utility energy efficiency programs are not included in the recent action analysis because they are incorporated in the utility load growth forecasts used in the [Iowa Inventory and Forecast](#).

### Transportation and Land Use Policy Options

Policy No.	Transportation and Land Use Policy Option	GHG Reductions (MMtCO <sub>2</sub> e)			Net Present Value 2009–2020 (Million \$)	Cost-Effective-ness (\$/tCO <sub>2</sub> e)
		2012	2020	Total 2009–2020		
TLU-1	Smart Growth Bundle with Transit	0.076	0.242	1.53	–\$377	–\$245
TLU-1a	Expand and Improve Transit Infrastructure	0.004	0.026	0.127	\$7.2	+\$57
TLU-2	GHG Impacts for State and Local Capital Funding	<i>Quantified as part of TLU-1 and TLU-1a</i>				
TLU-4	Support Passenger Rail Service in Iowa	N/A	0.008	0.026	\$15	+\$597
TLU-5a	Adopt Best Workplaces for Commuters in Iowa	0.02	0.02	0.21	\$18	\$84
TLU-5b	Distributed Workplace Models	<i>Non-quantified, qualitative option</i>				
TLU-6	Light Duty Vehicles Fuel Efficiency Incentives	0.44	3.65	17.70*	NQ	NQ
TLU-7	Fuel Efficient Operations for Light Duty Vehicles	0.11	0.65	3.41	–\$306.9	–\$90
TLU-8	New Vehicle Standards (Tailpipe GHG and Fuel Economy)	N/A	0.8	4.1	–\$246	–\$60
TLU-9	Freight Strategies (Truck and Rail)	0.39	0.63	5.9	\$30	+\$5
TLU-10	Fuel Strategies (20% Low Carbon Fuel Standard)	0.60	5.11	22.03	–\$1,359	–\$62
	<b>Sector Total After Adjusting for Overlaps and Synergies</b>	<b>1.64</b>	<b>11.14</b>	<b>55.03*</b>	<b>–\$2,218.50</b>	<b>–\$59</b>
	<b>Reductions From Recent Actions (Federal CAFE Requirements)</b>	<b>0.26</b>	<b>1.93</b>	<b>9.39</b>	<b>Not Quantified</b>	
	<b>Sector Total Plus Recent Actions</b>	<b>1.9 (8.3)</b>	<b>13.07 (48)</b>	<b>64.42</b>	<b>N/A</b>	<b>N/A</b>

CAFE = corporate average fuel economy [federal standard]; N/A = not applicable.

\*Deduct total TLU-6 2009-2020 reductions [17.7MMt] from 55.03 total = 37.3, before calculating cost/ton for TLU Options.

**Cross-Cutting Issues Policy Options**

Policy No.	Cross-Cutting Issues Policy Option	GHG Reductions (MMtCO <sub>2</sub> e)			Net Present Value 2009–2020 (Million \$)	Cost-Effectiveness (\$/tCO <sub>2</sub> e)
		2012	2020	Total 2009–2020		
CC-1	GHG Inventories, Forecasting, Reporting, and Registry	<i>Not Quantified</i>				
CC-2	Statewide GHG Reduction Scenarios	<i>Not Quantified</i>				
CC-3	State and Local Government GHG Emissions (Lead by Example)	<i>Not Quantified</i>				
CC-4	Public Education and Outreach	<i>Not Quantified</i>				
CC-5	Tax and Cap Policies—Lead Transferred to the CRE SC	<i>Not Quantified</i>				
CC-6	Seek Funding for Implementation of ICCAC Options	<i>Not Quantified</i>				
CC-7	Adaptation and Vulnerability	<i>Not Quantified</i>				
CC-8	Participate in Regional and Multistate GHG Reduction Efforts	<i>Not Quantified</i>				
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>				

For details on these options, adjustments for overlaps, definitions, etc. see the Iowa final report [Appendix I](#). For details on other sector-based options see [Part 2: Appendices](#)