



Iowa Climate Change Advisory Council

Clean and Renewable Energy (CRE)
Subcommittee Meeting #14

Aug 8th, 2008

Iowa Department of Natural Resources
The Center for Climate Strategies

Welcome and Introductions

- Iowa DNR
- Iowa Subcommittee (SC) Members
- Members of the Public
- Center for Climate Strategies

Agenda

1. Introductions and Roll Call
2. Approval of Summary of Call/Meeting #13 [Decision Item]
3. Review of Planning Process
4. Update on CRE-3b MGA Cap and Trade and CRE 4b Carbon Tax Modeling Efforts
5. Assumptions Review
6. POD discussion
7. Review of Next Steps
8. Agenda, Date and Time for Next Meetings
9. Public Comments and Announcements

Review and Approval of Prior Call Summary

- Review draft meeting summary for prior CRE SC call
- Consider any corrections or additions to meeting summary
- Move to approve meeting summary with agreed-upon changes

Stepwise Planning Process

- Develop inventory and forecast of emissions
- Identify a full range of possible actions
- Identify initial priorities for analysis
- Develop straw proposals
- Quantify GHG reductions and costs/savings
- Evaluate externalities, feasibility issues
- Develop alternatives to address barriers
- Aggregate results
- Iterate to final agreements
- Finalize and report recommendations

Policy Option Template

- ***Policy Description (Concept)***
- ***Policy Design (Goals, Timing, Parties Involved)***
- ***Implementation Methods***
- ***Related Programs and Policies (BAU)***
- ***Estimated GHG Savings and Costs Per MMTCO₂e***
 - ***Data Sources, Methods and Assumptions***
 - ***Key Uncertainties***
- **Additional (non-GHG) Benefits and Costs, as Needed**
- **Feasibility Issues, if Needed**
- **Status of Group Approval**
- **Level of Group Support**
- **Barriers to Consensus, if Any**

Economy Wide Modeling

- Initial results to be presented at the next CRE SC meeting.
- Preliminary modeling results pending ICCAC review and approval of IA cost curves.

Quantification Process

- Currently developing stand-alone cost estimates for each quantifiable option
- Once completed, the stand alone options will be adjusted to reflect existing actions
- Options will be also be modified to reflect overlaps within CRE options and between other subcommittee options

Draft Load Growth

- Refer to “08-08-06 IA CRE Load Growth Forecast”.xls file—Load growth tab
- Weighted average of 1.9% statewide over the planning period
- Early periods higher
- To be used to update Inventory & Forecast

Avoided GHG methodology proposal for EEC Subcommittee

- Ability to include large amounts of the marginal resource (gas) is constrained by small annual generation amounts
- A hybrid approach—
 - Use marginal analysis ~50% coal, 50% gas through 2012
 - (IA wont have imports in revised inventory and forecast)
 - For 2013 on use avoided new build mix

	% New Build 2014		% New Build 2014 No Renewables	
	Marshalltown	Elk Run	Marshalltown	Elk Run
Coal	83%	91%	99%	100%
Biomass	5%	3%		
Wind	11%	6%		
Gas	1%	0%	1%	0%

Avoided GHG methodology (II)

- Hybrid approach (marginal then avoided new build) is best, first-cut approach to how system will respond:
 - “Backing down” marginal resources in the short term (those with non-negligible fuel costs)
 - Avoiding new investments of thermal resources in the long term from clean energy deployment
 - This approach is satisfactory whether a state is an importer or exporter.
 - Reducing imports (a marginal resource) in the short term, and avoiding new thermal in the long term.
- For CRE quantification, renewables aren’t in the avoided new build mix, after all that what most of the policies try to un-avoid!

	% New Build 2014		% New Build 2014 No Renewables	
	Marshalltown	Elk Run	Marshalltown	Elk Run
Coal	83%	91%	99%	100%
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Coal Generation Assumptions

- Old coal cost (\$23.84 in 2020) assumes only the Walter Scott plant in IA is depreciated over the planning period
 - The rest of the coal fleet is fully depreciated throughout planning period.
 - In 2007, Walter Scott generated 30% of IA coal based electricity
 - EIA capital cost for new pulverized coal reduced by 70% to capture IA specific generation costs

Generation Assumptions

- Capital costs escalation in early years to adjust 2007 EIA Assumptions data to current prices
- Wind costs are 2.5x other resources 2009-2013 based on EIA, NREL data

REAL Capital Cost Escalation rates by fuel type (%)

	2006	2007	2008	2009	2010	2011	2012	2013	2014
Coal	0%	0%	0%	0%	0%	0%	0%	0%	0%
Nuclear	6%	8%	8%	2%	2%	2%	1%	1%	0%
Natural Gas	6%	8%	8%	2%	2%	2%	1%	1%	0%
Oil	6%	8%	8%	2%	2%	2%	1%	1%	0%
MSW	6%	8%	8%	2%	2%	2%	1%	1%	0%
Biomass	6%	8%	8%	2%	2%	2%	1%	1%	0%
LFG	6%	8%	8%	2%	2%	2%	1%	1%	0%
Wind	6%	8%	8%	5%	5%	5%	3%	2%	0%
Hydro	6%	8%	8%	2%	2%	2%	1%	1%	0%
Solar	6%	8%	8%	2%	2%	2%	1%	1%	0%
Fuel Cell	6%	8%	8%	2%	2%	2%	1%	1%	0%

2020 Snapshot

Generation Modeling Assumptions	2020					
	Fuel Cost \$/MMBTU	Capital Cost \$/kW	Capacity Factor	Renewables Tax Credits	Integration Cost	Generation Cost MWh
Coal (existing pulverized)	\$ 1.32	\$ 605	75%	\$ -	\$ -	\$ 23.84
Nuclear	\$ 0.50	\$ 2,631	90%	\$ -	\$ -	\$ 52.40
Natural Gas	\$ 5.50	\$ 751	75%	\$ -	\$ -	\$ 49.23
Oil	\$ 10.30	\$ 751	35%	\$ -	\$ -	\$ 58.09
MSW	\$ 0.50	\$ 2,016	90%	\$ -	\$ -	\$ 50.33
Biomass--Energy Crops	\$ 7.47	\$ 2,363	75%	\$ (10.00)	\$ -	\$ 120.12
Biomass--Ag Residues	\$ 7.47	\$ 459	75%	\$ (10.00)	\$ -	\$ 67.85
Landfill Gas	\$ 0.50	\$ 2,016	90%	\$ -	\$ -	\$ 50.33
Wind	\$ -	\$ 1,703	36%	\$ (20.00)	\$ 4.00	\$ 56.51
Hydro	\$ -	\$ 1,896	75%	\$ (10.00)	\$ -	\$ 32.88
Solar	\$ -	\$ 6,006	30%	\$ (10.00)	\$ -	\$ 254.60

Levelized and Avoided Costs CRE-4a

- The levelized costs of energy efficiency measures is \$37.13/MWh in 2009. Source for capital costs is from: Quantec/Cadmus. (2008).
 - This figure includes all utility and participant costs. Utility fixed costs are assumed to be 24% of the capital cost, based on MEC EE plan filing Docket # EEP-08-02. Vol II. pA1-8
- Avoided cost of electricity in 2009 is \$72/MWh.
 - Figure is from 2009–2013 Energy Efficiency Plan Interstate Power and Light Company Docket No. EEP-08-1 23-Apr-08, p. 33 Values base case without externality factor.

CHP Assumptions

- A host of assumption go into the CHP analysis
 - Power to heat ratio: usable heat per unit of power .55 for commercial, .2 for industrial and biofuels processing (Source: EPA catalogue of CHP technologies.)
 - Capacity charges: from placeholders from Portland General Electric schedule 575. Updates welcome.
 - Avoided capacity charges for commercial CHP are: Ancillary Service Charge of \$0.28/kW/ month, Facility Capacity--Distribution \$1.65/kW/ month, On Peak Demand Charge \$1.90/kW/ month, System Usage Charge \$0.35/ cents/kWh.
 - Avoided capacity charges for industrial and biomass are ½ those of commercial.
 - Displaced thermal load
 - Fixed and variable O&M are assumed to be \$0.07 MBTU ea
 - 80% boiler efficiency
 - Avoided CO2 emissions reflects CRE methodology

Revised Policy Option Document

- *Refer to current version of document*

Timing

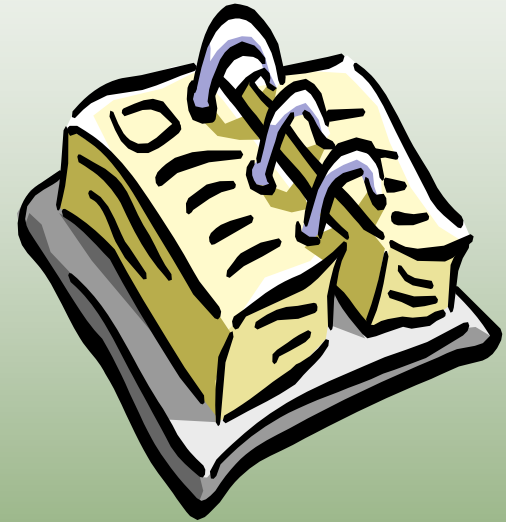
Date	Action
October 18, 2007	1st ICCAC meeting
December 17, 2007	2nd ICCAC meeting
February 8, 2008	3rd ICCAC meeting
April 11, 2008	4th ICCAC meeting
June 12, 2008	5th ICCAC meeting
September 3, 2008	6th ICCAC meeting
November 10, 2008	7th ICCAC meeting
December 15, 2008	ICCAC Final Report completed
Between ICCAC meetings	SC conference calls and meetings

Next Steps

- Continued Development of Remaining Subsections in the Policy Option Template for Each Option

Next Sub-Committee Meeting

- Next Call
 - CRE: Aug 11 at 1:00 Central



Public Input, Announcements