MEMO

To: **RGGI State Working Group & RGGI Stakeholders**
From: **Derek Murrow**
Date: **November 10, 2005**
Re: **Recent RGGI Modeling Results – Quick Summary of Issues**

The following is preliminary review of modeling results released by the RGGI state working group to RGGI stakeholders this week.

The new modeling runs completed by ICF consulting and the RGGI State Working Group use the Integrated Planning Model (IPM) to investigate the following issues:

1. Scenarios assessing (a) the impact of sustained high gas prices and (b) half of the regional RPS targets not being met; and
2. An assessment of using the Consumer Benefit Allocation to expand investments in energy efficiency.

ENE's preliminary comments on the high gas price and reduced RPS runs reflect two important points: (1), the modeling confirms that high price worries are not created by RGGI but by higher market prices independent of RGGI; and (2), that these modeling runs rely on questionable, extreme worst-case scenarios.

The modeling reveals important trends, which are consistent with previous modeling runs and which continue to illustrate how affordable the RGGI program should be:

- **Higher gas prices lead to significantly higher wholesale electric prices independent of RGGI:** The higher gas price assumptions lead to a 110% increase in wholesale electric prices in 2009 without the RGGI program being in place; when the RGGI cap and trade program is included, this only raises wholesale prices by 1% in 2009; this leads to the conclusion that high gas prices are a critical energy policy issue that should be addressed through energy efficiency and supply improvements, not that RGGI is unaffordable.
- **The modeling results also illustrate the tremendous benefit of using the value of allowances for a Consumer Benefit Allocation that expands energy efficiency investments:** The modeling includes using 25% of the allowance value to invest in energy efficiency and compares that to no increase in energy efficiency investments. The result is a 51% reduction in the very

modest 2009 wholesale electric price increase and a 34% reduction in 2012; these results clearly illustrate how energy efficiency investments significantly reduce the cost of the program for the region's consumers. In addition, this modeling only looked at the 25% minimum allocation of allowances for consumers being invested in energy efficiency, when states could choose to use 50% or even 75% for this purpose; previous REMI modeling that looks at full economic impacts of the program also illustrates that the economic and job growth benefits of increased energy efficiency investments far outweigh any costs associated with RGGI.

- **Lower RPS compliance has little to no impact on RGGI program costs:** an assessment of the reference case with 50% or 100% RPS compliance shows that emissions would increase slightly, but that energy prices stay essentially constant with natural gas remaining on the margin.

The inputs into the new high emissions IPM modeling runs represent extreme-worst-case scenarios that exceed current NYMEX future prices and fail to account for the beneficial impacts of steps to keep RGGI very inexpensive, such as innovation (what the program is designed to do) and a much larger allocation of allowances to expand investments in energy efficiency (>25 to the Consumer Benefit Allocation, as 25% is a minimum):

- **Modeling gas prices at $11.00 per MMBtu in real dollars (prices actually higher than $11 due to inflation) is inconsistent with either the futures market or professional forecasts of natural gas prices in coming years.**
    - The NYMEX futures market averages $9.65/MMBtu in 2007 and $7.64/MMBtu in 2009 when RGGI would begin. Expert natural gas forecasters such as EEA predict the long term price for natural gas could come down as low as $6 per MMBtu. New LNG terminals have been approved or are under consideration for the US and Canada (2 new terminals are being built in the Eastern Canadian Provinces which will supply New England via existing and underutilized pipelines) and the cost of natural gas is likely to be driven mostly by the marginal cost of LNG and the relationship to oil prices.
    - Very high natural gas prices would likely lead to reduced demand and policy decisions to increase energy efficiency investments, which is not addressed in the modeling. Natural gas distribution companies are regularly talking about consumers reducing consumption during periods of high prices and policy makers will likely feel they should act to provide relief to consumers in the form of expanded energy efficiency investments, both of which will reduce demand and the price of natural gas.
- **The short-term spike in natural gas prices from shut-in production due to hurricanes in the Gulf will have little to no impact on a policy that is not designed to go into effect until 2009.**
- **The renewable energy market in the Northeast is only just gearing up to satisfy the demands of the Renewable Portfolio Standards (RPS) in the various states and assuming only 50% of the targets are satisfied is not reasonable.** The delay in extending the federal production tax credit and the time lags associated with siting and permitting mean that there is now a tremendous pipeline of new projects to satisfy the RPS requirements. This trend is reflected in significant declines in REC prices in Connecticut due to new or upgraded generation

coming on line to meet Connecticut's Class I RPS requirements, and by developers considering building merchant wind facilities without having long-term contracts. In addition, the idea that many gigawatts of new coal could be sited in the region more easily than new renewables is very suspect.

The table and graph on the subsequent page of this memo present the IPM modeling results to date and illustrate the trends in terms of price changes and potential average bill impacts for residential customers. As these results indicate, even the extreme word-case model runs are very modest and the expected program costs are result in a less than 1% increase in wholesale electric prices (less than ½ of 1% for residential electric bills). High gas prices translate into high electric prices ***without*** RGGI being in place and implementing RGGI is extremely affordable. The results also highlight the savings and economic benefits of expanded efficiency investments through the Consumer Benefit Allocation which reduces the cost of RGGI, keeps energy dollars within the region, reduces consumer's energy bills, and leads to job and economic growth.

Cap and trade programs are designed to put the market and entrepreneurs to work leading to compliance at the lowest cost through trading and innovation. All of the modeling results are likely to be over estimate of the cost as the model does not assess the potential for innovation, which in other cap and trade programs for acid rain and ozone led to significantly lower compliance costs than were modeled.

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RGGI IPM Modeling Results

Wholesale Electric Prices (Firm Power in 2003$/MWh)

Year	2006	2009	2012	2015	2018	2021	2024	Avg
Standard Reference	$ 53.8	$ 50.6	$ 49.3	$ 46.7	$ 46.6	$ 46.6	$ 46.9	
Ref. w/ 2X Efficiency	$ 53.8	$ 50.3	$ 48.9	$ 46.6	$ 46.0	$ 46.2	$ 46.5	
Ref. w/ High Emissions	$ 56.6	$ 69.2	$ 52.8	$ 52.7	$ 52.2	$ 51.5	$ 51.1	
Ref. w/ Very High Emissions	$ 84.6	$ 106.4	$ 58.7	$ 55.6	$ 55.4	$ 54.7	$ 54.3	
Policy Package	$ 53.8	$ 50.8	$ 49.5	$ 47.1	$ 47.1	$ 47.2	$ 47.5	
Policy Package w/ 2X Efficiency	$ 53.8	$ 50.5	$ 49.2	$ 46.7	$ 46.5	$ 46.8	$ 47.1	
Policy Package w/ High Emissions	$ 56.9	$ 71.8	$ 56.2	$ 56.8	$ 56.9	$ 56.2	$ 55.7	
Policy Package w/ Very High Emissions (No CBA)	$ 84.8	$ 109.5	$ 67.7	$ 59.6	$ 60.3	$ 58.8	$ 58.4	
Policy Package w/ Very High Emissions (w/ CBA)	$ 84.8	$ 107.9	$ 64.7	$ 59.1	$ 59.5	$ 57.4	$ 56.4	
Price Increases Due to RGGI								
Standard Reference								
$/MWh	$0.00	$0.22	$0.21	$0.39	$0.48	$0.62	$0.62	**$0.36**
%	0.00%	0.43%	0.42%	0.82%	1.04%	1.34%	1.33%	**0.77%**
Avg. Annual Bill Increase	-$0.01	$1.56	$1.49	$2.75	$3.45	$4.46	$4.44	**$2.59**
Assume Avg. Residential Elec (kWh/year) =	7,142							
2X Efficiency								
$/MWh	$0.00	$0.20	$0.30	$0.18	$0.51	$0.52	$0.57	**$0.32**
%	-0.01%	0.39%	0.61%	0.39%	1.10%	1.13%	1.23%	**0.69%**
Avg. Annual Residential Bill Increase	-$0.03	$1.41	$2.13	$1.29	$3.63	$3.72	$4.08	**$2.32**
High Emissions								
$/MWh	$0.24	$2.59	$3.46	$4.13	$4.64	$4.76	$4.62	**$3.49**
%	0.42%	3.74%	6.56%	7.84%	8.89%	9.25%	9.05%	**6.53%**
Avg. Annual Residential Bill Increase	$1.68	$18.50	$24.74	$29.51	$33.14	$33.99	$33.02	**$24.94**
Very High Emissions (No CBA) - Note: this is not consistent with the policy proposal								
$/MWh	$0.27	$3.08	$8.96	$3.96	$4.86	$4.12	$4.03	$4.18
%	0.32%	2.90%	15.25%	7.11%	8.77%	7.52%	7.41%	7.04%
Avg. Annual Residential Bill Increase	$1.95	$22.03	$63.99	$28.26	$34.72	$29.40	$28.78	$29.87
Very High Emissions (w/ CBA) - Note: this is consistent with the minimum proposal for the CBA								
$/MWh	$0.22	$1.52	$5.95	$3.46	$4.06	$2.64	$2.02	**$2.84**
%	0.26%	1.43%	10.12%	6.23%	7.32%	4.83%	3.72%	**4.84%**
Avg. Annual Residential Bill Increase	$1.58	$10.87	$42.47	$24.74	$28.97	$18.85	$14.44	**$20.27**
CBA Benefit (reduced cost from efficiency)	**-19.05%**	**-50.66%**	**-33.63%**	**-12.44%**	**-16.56%**	**-35.86%**	**-49.82%**	**-31.15%**