

Senate Concurrent Resolution #28
Workgroup
Final Report

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Acknowledgements:

This report represents the work of the SCR 28 workgroup. All of the workgroup’s meeting agendas, minutes, handouts, presentations and supporting materials are available on line at <http://www.awm.delaware.gov/Info/Regs/pages/SCR.aspx> This report was prepared by staff in DNREC with the assistance of Ms. Yusha Hu, graduate student at Swarthmore College, who interned with DNREC during the Winter 08 session. The workgroup hereby acknowledges and appreciates the work of Ms. Hu. The workgroup would also like to thank Ms. Vicki Ward, Administrative Specialist in the DNREC Office of the Secretary for her hard work in preparing workgroup minutes and arranging all logistics for our meetings.

The workgroup has reviewed and commented on this report and has agreed to its contents. While consensus could not be reached on our recommendation, dissenting opinions are welcome and have been solicited.

1. The Regional Greenhouse Gas Initiative (RGGI)

The Regional Greenhouse Gas Initiative, or RGGI, is a cooperative agreement among 10 Northeastern states to combat climate change by committing to a reduction of carbon dioxide emissions—a greenhouse gas that contributes to global warming. There is growing scientific consensus that increased anthropogenic emissions of greenhouse gasses are enhancing the natural greenhouse effect and contributing to significant changes in the Earth’s climate. Climate change is expected to raise sea level, increase the likelihood of both droughts and floods, alter seasonal patterns, and impact air quality, fresh water supplies, beaches, marshes, and wildlife, in addition to forests, crop yields, human health, buildings and roads in Delaware.¹

In order to address this important environmental issue, the RGGI participating states (DE, NJ, MD, NY, CT, RI, MA, NH, VT, & ME) will implement a multi-state cap-and-trade program with a market-based emissions trading system. The RGGI program targets reductions from fossil fuel-fired power plants of 25 MW or greater nameplate capacity within the 10 state region. The cap-and-trade program limits carbon dioxide (CO₂) emissions by placing a cap on the total amount of CO₂ emitted from power plants (“generators”) in the RGGI region, requiring generators to submit a RGGI allowance for each ton of CO₂ emitted. As that emission cap is lowered over time, the program will require generators in participating states to reduce CO₂ emissions 10% below the initial annual CO₂ budget by 2018, as outlined in the RGGI Memorandum of Understanding (MOU).²

The market-based trading system allows RGGI allowances to be traded among companies so that reductions can be achieved efficiently, at the lowest marginal cost of emission abatement across the spectrum of affected facilities in the 10 states. Furthermore, a carbon constraint on fossil fuel-fired electricity will create an incentive for the creation, development, and deployment of more efficient fuel-burning technologies and processes, as well as renewable energy supplies, demand-side management practices and actions to increase energy efficiency and conservation, leading to less dependence on the import of, and use of, fossil fuels. The Regional Greenhouse Gas Initiative provides a possible model for the implementation of a federal emissions trading scheme while increasing pressure for federal legislation to address the issue of climate change.

RGGI is a cooperative effort on the part of 10 states, requiring each state to promulgate state rules and regulations in order to participate in the regional effort. Regionally, during 2000-2002, the average annual emissions of CO₂ from power plants in the 10 state region were roughly 188,000,000 tons. Under the MOU, each state receives an allocation equivalent to its contribution to the total. The RGGI MOU requires a minimum of 25% of each state’s emission allowances to be used for public benefit and strategic energy purposes. The disposition of the remaining 75% of allowances held by each state is left to the state.

¹ See the EPA’s “Climate Change and Delaware” available at http://www.awm.delaware.gov/NR/rdonlyres/703E698E-DA83-4217-950E-F03F96C94573/2798/de_impct.pdf and “The Northeast Climate Impacts Assessment” available at http://www.awm.delaware.gov/NR/rdonlyres/703E698E-DA83-4217-950E-F03F96C94573/2799/NECIA_climate_report_final.pdf

² RGGI MOU available at http://www.rggi.org/docs/mou_12_20_05.pdf

2. Purpose of the SCR 28 Workgroup

On June 30, 2007, the General Assembly passed Senate Concurrent Resolution (SCR) #28 calling on the Secretary of the Department of Natural Resources and Environmental Control (DNREC) to convene a workgroup to consider the allocation and/or sale of CO₂ allowances under RGGI and the use and management of potential revenue stemming from any such allowance sales. The Workgroup was tasked to study the RGGI MOU, analyze the actions of other RGGI states, and consider and recommend the best course of action for Delaware. Members of the workgroup and their affiliations are found in Appendix D.

The workgroup has wrestled with two principle questions:

1. What percent of Delaware’s allowances should be auctioned (as opposed to allocated directly to generators), and
2. What should be the fate of any revenue generated through the sale of allowances?

Under the SCR, this revenue may be used to further the goals of the Sustainable Energy Utility or such other goals the Workgroup may consider and that are consistent with the RGGI MOU.³

3. The State of Delaware

3.1 Electricity generation in Delaware

Electricity serving Delawareans comes from both local, in-state generation sources and from imports from our regional electric grid operated by PJM. In 2006, Delaware had a generating capacity of approximately 3000 MW. Delaware facilities subject to RGGI (the “Generators”) account for the majority of that capacity and are shown in Table 1.

Table 1. Electricity generating facilities in DE greater than 25MW

Facility (units)	Unit types	Generation (MW)	Start-up Year	Fuel type
NRG Indian River (4)	Steam Turbines	82, 82, 177, 442	1957, 1959, 1970, 1980	Coal
Conectiv Edge Moor (3)	Steam Turbines	75, 177, 446	1954, 1966, 1973	Coal (446 Residual Oil)
Conectiv Hay Road (8)	6 Combined Cycle (CC) (2 Waste Heat)	658, (220)	1989, 1990, & 2001	Pipeline Natural Gas/waste heat
Conectiv Christiana	Combustion Turbine (CT)	29,29	1973, 1973	No 2 Oil
Dover - McKee Run (1)	Steam Turbine	113.6	1975	Residual Oil
Dover - Van Sant (1)	CT	45.1	1991	Diesel Oil
DEMEC - Smyrna (1)	CT	45	2002	Natural Gas
NRG Dover (2)	CT	45, 45	2001, 2001	Natural Gas
Motiva Refinery (6) (Now Premcor)	Steam Turbines CT's	27.5,27.5,75,10,92,92	1956, 1961, 2000	Natural gas, gasification syngas, refinery fuel gas, and low sulfur diesel fuel

³ From SCR 28 found at:

<http://www.awm.delaware.gov/Info/Regs/Documents/c35fe7643fb94a459964c56db24b3474SCR28.pdf>

Delaware, however, does not generate all the electricity it needs. In 2006, Delaware imported approximately 38% of the electricity consumed in the state⁴. Imports are realized through the PJM grid as explained below. Figures 1 and 2 portray relative percentages of fuels used to generate electricity in-state and the percentage of power imported into Delaware.

Figure 1.

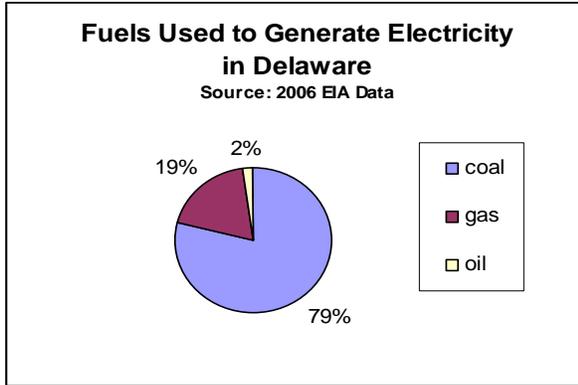
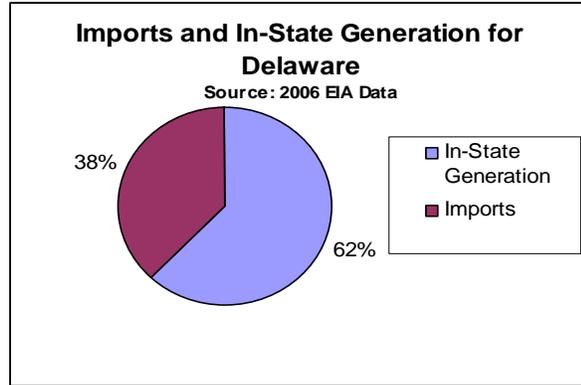
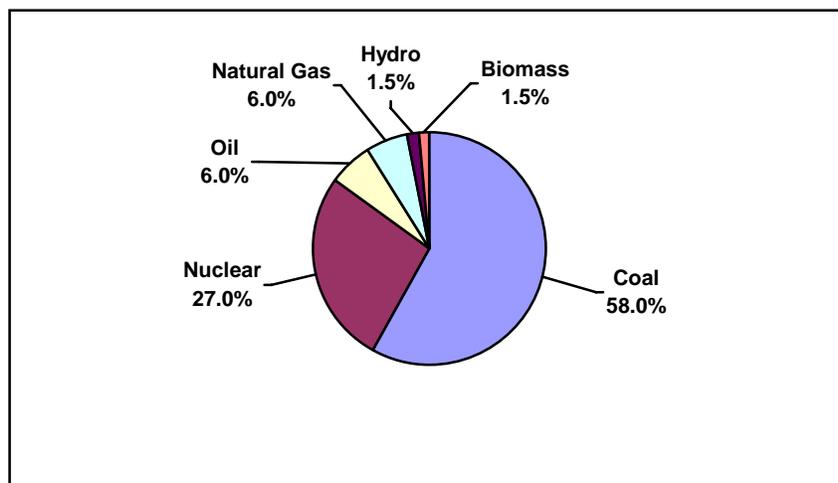


Figure 2.



Because Delaware imports a large portion of its electrical needs, the fuel mix for electricity consumed in Delaware looks very different from that produced in Delaware. This is also due to the bidding and purchasing processes used in Delaware to obtain power for residential, commercial and industrial uses from throughout the PJM region. Figure 3 portrays the best estimate of fuel mix for power consumed in Delaware.

Figure 3. Fuels Used to Generate Electricity Consumed in Delaware
(Source: PJM data)



⁴ Energy Information Administration, found at http://www.eia.doe.gov/cneaf/electricity/st_profiles/sept01de.xls

3.2 Carbon Emissions from Delaware's Generators

The RGGI MOU sets an initial emissions allocation of 7,559,787 tons of carbon dioxide for Delaware, which is roughly equivalent to the average annual emissions from 2000-2002 for all affected facilities in Delaware. Affected facilities are defined as any fossil-fueled energy generating units with capacity in excess of 25 MW. Appendix A provides a list of all affected facilities and their emissions through 2006.

The Delaware City Refinery (Premcor) units account for 15.5% of Delaware's allocation. They are shown separately (as "Motiva Refinery") in Appendix A, in recognition of the possibility that they may be exempted from the RGGI program, in accordance with the RGGI Model Rule, if they sell less than 10% of their generation capacity into the regional electric grid. If Delaware is to follow this optional provision of the RGGI Model Rule (most states have), Premcor may apply to be excluded from the RGGI cap, which, if approved, would result in a lowering of the Delaware allocation by 15.5% from the current figure, resulting in a net allocation to Delaware of 6,385,752 tons. The regional RGGI cap would be similarly lowered.

Additionally, an initiative independent of RGGI is leading to the retirement of NRG Indian River Units 1 and 2 in 2011 and 2010, respectively. Because both units are high-emission coal-powered plants, this retirement will result in a significant decrease in state CO2 emissions, however, Delaware's allocation of allowances remains unchanged under the MOU.

3.3 Delaware and PJM

Delaware generators are a part of the PJM electric grid, which also includes New Jersey, Maryland, Pennsylvania, Virginia, West Virginia, the District of Columbia, and portions of Ohio, Indiana, Illinois, Michigan, Kentucky and North Carolina.⁵ Because Delaware, New Jersey, and Maryland, all RGGI participating states, are a part of a competitive wholesale electricity market that also includes non-RGGI states, they face a different situation than the other 7 RGGI states, all of whom operate within power pools (ISO New England and the New York ISO) entirely covered by RGGI.

Generators inside the RGGI region will be required to obtain and hold allowances equal to their emissions, possibly increasing costs for generators inside the region. Generators outside the RGGI region will not have those added costs, and when bidding into the PJM market, may bid lower prices than their RGGI counterparts, leading to a possible shift in generation to outside the RGGI region and resulting in "leakage" of the emission reductions sought within it. The implementation of RGGI in PJM states may therefore create financial inequities between RGGI states and non-RGGI states within PJM, while at the same time reducing the efficacy of the program. Alternatively, if generators within the RGGI region submit higher bids for the electricity they sell into the PJM wholesale market (to cover their RGGI compliance costs), and

⁵ <http://www/pjm.com/about/territory-served.html>

if those RGGI generating units are on the margin, the wholesale cost of power could increase throughout the PJM market. Delaware's RGGI Units are estimated to be on the margin approximately 20% of the time.⁶

3.4 "Leakage" impacts on Delaware

Leakage is a term applied to the increased importation of electric power from non-RGGI states as a result of regulations that increase the cost of electricity generation within the RGGI region. Leakage may have negative effects on overall emissions reductions because the displacement of RGGI generation by non-RGGI generation means that CO₂ emissions are not decreasing, just relocating.

However, the extent to which leakage can occur is limited by transmission capacity as well as by differences in locational marginal pricing (LMP). LMP is the collective term for differences in the cost of supplying the next MWh of generation at specific locations on the same grid. On the PJM grid, there tends to be a \$4-8/MWh differential between the west side of the grid, which is less expensive, and the east side of the grid, which Delaware is a part of.⁷ This differential exists because of congestion, caused by limited transmission capability, and because of additional costs applied to transferring electricity from one part of the grid to another. The competitive advantage of non-RGGI generators is potentially diminished as a direct function of how far they are from the location where electricity is being purchased.

A significant degree of uncertainty exists about how much leakage will occur in Delaware; no accurate baseline data exist for current carbon emission due to imported power.⁷ During development of the RGGI program, RGGI states contracted with ICF International to model the region's electrical system and, using the Integrated Planning Model (IPM), attempted to quantify the impacts of the program on power markets. IPM modeling estimated cumulative emissions leakage to be 27% of net CO₂ emissions reductions for the entire RGGI region through 2015, with the majority of it occurring in PJM states including Delaware.⁸ However, IPM modeling projects, on a regional basis, that the majority of leakage will be caused by a shift in new plant construction from RGGI states to states outside the RGGI region. Mitigating the impetus for regional shifts in new plant construction resulting from RGGI is the importance of location-specific demand, access to transmission for new units, local siting and permits, and power purchase contracts and financing.⁹ Therefore, leakage due to the increased importation of power from existing out-of-state generators and the decreased use of in-state generators should be less than predicted by the IPM modeling. The IPM modeling did not, however, anticipate the retirement of Indian River Units 1&2, which has the potential to increase imports

⁶ Personal communication Jeff Bladen at PJM and discussed at the workgroup meeting on 3/10/08

⁷ Initial Report of the RGGI Emissions Leakage Multi-State Staff Working Group to the RGGI Agency Heads, March 2007.

⁸ IPM modeling, ICF Consulting. IPM runs dated October 11, 2006, available at <http://www.rggi.org/documents.htm>.

⁹ Initial Report of the RGGI Emissions Leakage Multi-State Staff Working Group to the RGGI Agency Heads, March 2007.

Solutions to the leakage problem are not readily apparent, however, IPM modeling found a strong correlation between the investment in energy efficiency and the reduction of leakage. To the extent that states invest in energy efficiency and drive down demand for electricity, leakage is reduced. Studies conducted in both Maryland and New Hampshire indicate that not only does energy efficiency reduce leakage, but it can result in positive economic impacts for states participating in RGGI - mitigating any increase in electricity rates that result from participation.¹⁰

4. The Actions of other RGGI States

The two questions posed in Section 2 of this report:

1. What percentage of allowances should be auctioned, and
2. What should be done with the revenue?

have been addressed in different ways among the 9 other RGGI states. The RGGI MOU requires that, at a minimum, 25% of allowances be directed to “public benefit purposes”, defined as:

“the use of the allowances to promote energy efficiency, to directly mitigate electricity ratepayer impacts, to promote renewable or non-carbon-emitting energy technologies, to stimulate or reward investment in the development of innovative carbon emissions abatement technologies with significant carbon reduction potential, and/or to fund administration of this Program”

4.1 Allocation or Auction?

All other RGGI signatory states have opted to auction a significantly greater portion of their allowances than the minimum 25% required under the MOU. Some variation in allowance allocations exist in some states to account for high efficiency Combined Heat and Power (CHP) units, to recognize long term contracts already in place between generators and customers, and to recognize early reductions taken in some states with carbon reduction laws already on the books. Still other states have built into their allocation processes relief from high allowance prices and commitments to sell (rather than auction) allowances if certain price triggers are hit.

Another technique used by the states to reward investment in renewable energy production is renewable set-asides. Massachusetts, Maine, Rhode Island and New Hampshire all plan to take a step beyond zero allocation, and retire allowances as renewable energy credits are bought voluntarily by private consumers, setting aside up to 1% of allowances for cap reduction beyond RGGI requirements.

¹⁰ RFF/University of Maryland Study; Additional Model Analysis of Maryland Joining RGGI, found at <http://www.awm.delaware.gov/Info/Regs/Documents/a13a45d7a66d41d1910a3569c5454118MDfollowupmemofromRFF91807.pdf>

These variations among the states are significant, but pale in comparison to the decision by all states to auction far greater than the required 25% minimum. Appendix B provides details on each state's plans for auction percentages.

4.2 The Disposition of Revenues

Generally, all states target energy efficiency as a recipient of RGGI revenues, with some variations. Each state varies with respect to how it administers its funds and how they are to be spent. Many states have yet to decide the precise details of expenditures but are provided guidance or direction in enabling statutes as notated in Appendix B.

A complete description of each state's requirements for distribution of RGGI revenues is provided in Appendix C. In each state, a portion of RGGI revenues is also allotted for administration of RGGI and other climate change programs within the state.

4.3 Leakage

Pursuant to the RGGI MOU, the states have extensively studied the issue of leakage and what response actions might be appropriate given what we know of the leakage issue, the impacts efficiency investments can have on leakage, and the prospects for a federal program in the future. In its final report on leakage, all RGGI states have agreed that, working with the ISO's, states should track leakage effects through the first compliance period. In the interim, all states should pursue a leakage mitigation policy of increased investment in existing energy efficiency, market transformation programs, and the implementation and expansion of complementary policies such as building energy codes and appliance and equipment standards that accelerate the deployment of end-use energy efficiency technologies and measures¹¹.

Beyond the interim regional solution, state responses to leakage vary according to location. As noted above in Section 3.3, Maryland, New Jersey and Delaware are somewhat different than their New England counterparts because they operate in a competitive market made up of RGGI states and non-RGGI states. They are also unique to themselves, as Maryland is a net exporter of power and New Jersey, like Delaware, is a net importer. New Jersey, with passage of recent legislation, has taken more aggressive steps to address leakage and has directed the Board of Public Utilities (BPU) to develop "...a greenhouse gas emissions portfolio standard to mitigate leakage or another regulatory mechanism to mitigate leakage applicable to all electric power suppliers and basic generation service providers that provide electricity to customers within the State"¹². This effort will be extensive, expensive, and administratively complex and will be closely watched by all RGGI states into the future.

¹¹ RGGI states final report on leakage available at:

¹² NJ State Legislature Bill 4559 adopted January 3, 2008

5. Possible Impacts of RGGI on Delaware

5.1 RGGI impact on electricity rates for consumers

Modeling analyses conducted by ICF International for RGGI states indicate the potential for a 1% increase in wholesale electric rates at the start of the program in 2009, increasing to 1.75% by 2018.¹³ The exact price impacts will not be known until the program is underway and we see the impact of the competitive market on allowance prices. It is also important to point out that the IPM modeling estimates are “RGGI wide” and not predictive for individual state impacts.

A 1% increase in electric rates as a result of RGGI is very modest, and should be placed in context with recent increases in electricity prices in the last few years. By example, Delmarva Power SOS (Standard Offer Service – for residences and small businesses) customers saw a 59% increase in electricity rates in 2006, independent of RGGI initiatives. Such a steep increase, even when averaged over a flat rate since 2000, represents an 8% annual increase during those years. Additional price impacts from PJM’s new Reliability Pricing Model and the added costs of new capacity in Delaware and elsewhere are similarly impacting prices.

The impact of RGGI on the price of electricity for the consumer has been found to be independent of the percentage of allowances auctioned¹⁴. It is often assumed that the less capital generators have to spend on the allowances they acquire, the smaller the increase ratepayers will see in the price of electricity. However, this may not be the case. Some RGGI state officials have asserted that whether allowances are acquired at no cost or whether they are purchased at auction, the generator will, when possible, pass on the value of the allowance and add it to the variable cost of electricity generation for the customer. Even if the allowance is acquired at no cost, the generator loses the opportunity of selling it on the market if it must be used to cover carbon emissions; the generator can make up for that lost revenue by increasing the price of electricity for the consumer.¹⁵ However, generators operating in Delaware (like those in MD and NJ) operate on an unequal playing field with respect to RGGI compliance, and must balance their pricing of power against their position in the competitive marketplace, suggesting that the expectations for other RGGI states may not apply here.

¹³ IPM RGGI Electricity Sector Modeling Results as presented to the SCR 28 workgroup and found at: <http://www.awm.delaware.gov/Info/Regs/Documents/0c8105de9e594764b0f417a53239be85ICFDelawareRGGIpresentation111907.pdf>

¹⁴ Personal communication: Steve Fine from ICF to the workgroup on November 19, 2007

¹⁵ Statement of the NY Attorney General May 2, 2006 and found at: <http://www.fiscalpolicy.org/NYAttorneyGeneralPreliminaryRGGIComments.htm>

5.2 RGGI impact on electricity price volatility

As with any emerging market, volatility may be a significant factor. Price volatility in the emission allowance market will hinder effective planning for investments in carbon abatement for electricity generators and others. Market volatility will represent a significant factor for electricity generators, who can be expected to collectively spend close to \$15 million in only the first year of auctions--assuming a 100% auction and \$2/ton for emission allowances (IPM estimate). Because the first few years of the market could be characterized by considerable price volatility, generator costs for allowances may be greater than projected. Partial allocation (a less than 100% auction) may reduce price volatility as well as early program risk and uncertainty for Delaware electricity generators.

5.3 RGGI impact on producer costs and profit margin

As discussed in Section 3, the implementation of RGGI in some PJM states may create financial inequities between RGGI states and non-RGGI states. The increase in variable costs due to the auctioning of carbon emission allowances may raise the bids of Delaware electricity generators, and may affect the total amount of electricity they will be able to sell on a competitive wholesale market. An alternative outcome may be to raise the price of electricity throughout the PJM market, if Delaware generators are at the margin. The costs of compliance with RGGI will be borne either by the generator, resulting in a potential loss of profitability or asset value¹⁶, or by the consumer, resulting in higher costs overall – or some combination of the two as determined by the market.

Delaware is a deregulated electricity market, as such market forces may lead Delaware generators to attempt to maintain market share by not raising electricity bids enough to fully offset increased costs. In such a case, while the amount of electricity sold by a Delaware generator may not decrease, the profit margin per kWh of electricity sold would decrease as a result of RGGI regulations.

5.4 RGGI's Environmental Impacts

RGGI is a very modest program compared to the reductions in emissions of greenhouse gases advocated by the International Panel on Climate Change (IPCC). Its goal of a 10% reduction by 2018 for CO₂ from power plants in the RGGI region is substantive and real, but will not change emissions beyond the 10 state region, nor appreciably address this international problem.

¹⁶ ICF analysis as presented to the SCR 28 workgroup and found at: <http://www.awm.delaware.gov/Info/Regs/Documents/0c8105de9e594764b0f417a53239be85ICFDelawareRGGIpresentation111907.pdf>

RGGI is, however, an important beginning, and can provide valuable lessons for a more comprehensive effort while helping to place Delaware in a leading role in the effort to address climate change. The proceeds from the auction of emission allowances, can, if wisely used, promote conservation, energy efficiency, and the use of renewable energy sources, thereby reducing the rate of growth of generation, and reducing greenhouse gas emissions in other sectors of the economy. RGGI revenues also have a substantial potential for cushioning the poor from rapidly increasing energy prices via investment in energy saving technologies and public assistance efforts.

6. Workgroup Conclusions

The workgroup has consistently focused on the two questions before them separately, and yet the two have been inextricably linked throughout the workgroup's process. To proceed with RGGI, both in participation in upcoming regional auctions and in proceeding with DNREC's cap and trade rulemaking process, Delaware need only solve the issue of how many allowances to auction.

What follows here is a summation of the workgroup's conclusions on the two questions and a recommendation for further action by the Delaware General Assembly.

6.1 Allowance allocation

When the RGGI states agreed to the cap and trade program in 2005, they agreed to dedicate a minimum of 25% of allowance sales to public benefit purposes as defined in the MOU. The remaining 75% was left to states to decide how to distribute. As in the NO_x and SO₂ cap and trade programs, it was initially anticipated by the states that the remaining allowances would be allocated directly to generators. There were, however, several studies done over the next few years that concluded that regardless of how CO₂ allowances were distributed, generators would seek to obtain their value in bidding power into regional markets,¹⁷ and consumers would still bear the full cost of the program. In addition, some states began to identify the benefits of funneling all RGGI allowance revenue into energy efficiency and consumer benefit programs, to help reduce energy demand, ease customer impacts and reduce emissions associated with generation. For these reasons, most RGGI states have opted to auction all or nearly all of the allowances provided under the program.

All members of the SCR 28 workgroup believe that an eventual 100% auction is an acceptable approach. The generators have proposed a ramp-up to 100%, beginning at 55% auction and increasing to 100% over a five-year period. This "easing into" 100% was suggested because of uncertainties in the market place, the expected volatility early in the trading program

¹⁷ Evaluation of CO₂ Emission Allocations as Part of the Regional Greenhouse Gas Initiative, Rutgers University, 12/05 and found at: <http://www.awm.delaware.gov/Info/Regs/Documents/68872657103c437e8df1aabace8cbac6RutgersreportonCO2auctioning2005.pdf>

and as a way to minimize economic impacts on consumers.¹⁸ This approach also allows Delaware the necessary lead time to effectively utilize expected funds. Other members have suggested a phased approach beginning at 70% and reaching 100% within three years¹⁹. One member reminded the workgroup of Delaware’s vulnerability to climate change and the need to reduce CO₂ emissions from all sources by at least 80% by 2050²⁰. In order to achieve this, he argued for a 100% auction. DNREC, by a memorandum from Secretary Hughes, has endorsed the phased approach and suggested that a starting point of 60%, rising to 100% over 4 years may be acceptable, as Delaware’s situation is somewhat different from that of many other states.²¹

6.2 Revenue Disposition

A separate, yet seemingly linked question to that of the percent auction is the fate of the revenues generated. It is difficult to estimate how much revenue might be expected, because prices in this new marketplace are unknown and because the allocation formula is not yet determined. Using the ICF Integrated Planning Model (IPM), the RGGI states have estimated allowance values at \$2.00/ton for the beginning of the program (2009) rising to \$4.50 by 2021.²² Until the first RGGI auction takes place in September, 2008, actual allowance prices are unknown. RGGI states have, however, recently determined that the use of a “reserve price” for the first and subsequent auctions is appropriate and have set that reserve at \$1.86/allowance²³.

Table 2 presents revenue estimates at varying auction percentages and allowance prices using a total of 6,385,752 allowances (without Premcor).

Table 2. Annual RGGI revenue estimates (\$millions)

CO2 Allowance Price	60% Auction	70% Auction	100% Auction
\$2	\$7.7	\$9.0	\$12.8
\$5	\$19.1	\$22.4	\$31.9

During workgroup meetings, suggestions for use of RGGI revenue have included end-use energy efficiency measures, incenting renewables, direct mitigation for low to mid-income ratepayers and transportation fuel efficiency measures, much of which would be conducted by the SEU. In addition, research and development, adaptation planning and public education to

¹⁸ Generators 3/10/08 proposal and found at:

[http://www.awm.delaware.gov/Info/Regs/Documents/SCR%2028%20Generators%20Proposal%20Final%20030508.ppt#268,5,Distribution of Proceeds as Allowances DE Generators Proposal for a Transition to a 100% Auction](http://www.awm.delaware.gov/Info/Regs/Documents/SCR%2028%20Generators%20Proposal%20Final%20030508.ppt#268,5,Distribution%20of%20Proceeds%20as%20Allowances%20DE%20Generators%20Proposal%20for%20a%20Transition%20to%20a%20100%20Auction)

¹⁹ Proposal submitted on behalf of Messrs. Fiorentino, Tolman and DiPasquale and found at:

http://www.awm.delaware.gov/Info/Regs/Documents/RGGI_Env_Proposal%20032308.pdf

²⁰ Presentation and report by Chad Tolman found at:

<http://www.awm.delaware.gov/Info/Regs/Documents/RGGIWGPAPER20608.doc>

²¹ Memorandum from John A Hughes to the SCR 28 workgroup dated March 6,2008 and available at

<http://www.awm.delaware.gov/Info/Regs/Documents/Memo%20to%20SCR%2028%20group%20from%20JAH%2003-6-08.pdf>

²² ICF modeling data presented to SCR 28 workgroup on 11/19/07 and found at:

<http://www.awm.delaware.gov/Info/Regs/Documents/0c8105de9e594764b0f417a53239be85ICFDelawareRGGIpresentation111907.pdf>

²³ RGGI Auction Design Principles found at: http://www.rggi.org/docs/20080317auction_design.pdf

strengthen the understanding of energy efficiency, carbon dioxide emissions, and climate change were suggested to receive funding. At least one member suggested a much greater focus on development of utility scale renewable energy as a means of achieving needed CO₂ and that energy efficiency and solar PV, while helpful, are not sufficient to provide the needed reductions in CO₂ emissions. Forestland preservation to reduce the rate of deforestation in Delaware and offset carbon emissions has also been proposed by stakeholders as a use of RGGI revenue.²⁴ The generators have also suggested that 5% of the allowances be used to fund carbon abatement programs (shown below in Section 7 as a “Carbon Fund”).²⁵

All workgroup members agree to several basic principles:

- All RGGI revenues should be directed to public benefit programs regardless of auction percentage.
- Some portion of revenues should be used to help make Delaware more energy efficient and to promote renewable energy sources.
- Some portion of revenues should be directed to low and moderate income ratepayers to help them become more energy efficient through weatherization efforts and to help meet high energy costs through the Low Income Home Energy Assistance Program (LIHEAP).
- An appropriate portion of revenues should be directed to DNREC to run RGGI and other climate change programs.

All members endorse use of at least a portion of the revenues for promoting energy efficiency. Studies have shown that such investments may actually result in lower costs for electricity to consumers. New Hampshire, for example, estimates that Public Service of New Hampshire (PSNH) customers will see an annual decrease of 1.4% in their electricity bills by 2018 if 100% of allowances are auctioned and revenue is invested in energy efficiency measures.²⁶ Maryland estimates that the allocation of each additional 25% of its RGGI allowance auction proceeds towards energy efficiency initiatives can be expected to yield a decline in electricity prices of about 0.25% after 2010.²⁷

Efficiency investments also reduce the potential for leakage, reduce transmission system congestion, forestall the need to build new transmission capacity and result in lower emissions of other priority pollutants including fine particulates, mercury, NO_x and SO₂.

The Sustainable Energy Utility (SEU), created in 2007 by the Delaware General Assembly, has as its primary mission the establishment of energy efficiency, energy conservation and renewable energy programs in Delaware.²⁸ The workgroup has debated at length the

²⁴ Roger Jones, The Nature Conservancy available at <http://www.awm.delaware.gov/NR/rdonlyres/703E698E-DA83-4217-950E-F03F96C94573/3110/EmailSCR28WorrkgroupRJones120607.pdf>

²⁵ Revised Generator proposal presented March 10, 2008 found at: [http://www.awm.delaware.gov/Info/Regs/Documents/SCR%2028%20Generators%20Proposal%20Final%20030508.ppt#256,1,DE Generators Proposal for Transition to 100% RGGI Allowance Auction Amended Generators Proposal](http://www.awm.delaware.gov/Info/Regs/Documents/SCR%2028%20Generators%20Proposal%20Final%20030508.ppt#256,1,DE%20Generators%20Proposal%20for%20Transition%20to%20100%20RGGI%20Allowance%20Auction%20Amended%20Generators%20Proposal)

²⁶ As estimated by New Hampshire Department of Environmental Services and the University of New Hampshire, available at <http://www.des.state.nh.us/ard/climatechange/pdf/economicFAQs.pdf>

²⁷ As estimated by Resources for the Future, available at <http://www.awm.delaware.gov/NR/rdonlyres/703E698E-DA83-4217-950E-F03F96C94573/2853/MDfollowupmemofromRFF91807.pdf>

²⁸ See <http://www.seu-de.org/index.html>

suitability of the SEU to carry out efficiency programs funded with RGGI revenues and whether or not the SEU is in need of the revenue generated by RGGI. Most workgroup members believe the SEU is the correct vehicle to furnish efficiency, conservation and renewable programs, however a few have asserted the SEU was to have been financially self-sustaining and would not need the additional revenue. Members of the SEU Oversight Board on the workgroup have corrected this characterization, noting that the SEU is defined in the legislation to be the State's vehicle for leveraging public and private financing for energy efficiency, energy conservation and distributed renewables to stimulate their expanded use in Delaware. It was additionally noted that more resources available to the SEU simply translates into an enhanced ability to accomplish more energy savings and customer sited renewables, and that the SEU should be the recipient of the bulk of RGGI revenues. One member of the public suggested that the RGGI revenue is uncertain, and that the best course might be to simply set the revenue aside for a year or more and wait to see how much revenue is realized and where it might be best utilized.²⁹ This suggestion seemed to resonate with some workgroup members, however, others warned against use of a "holding account".

6.3 Recommendation

The workgroup recommends legislation be drafted and passed this year providing for a program with the following provisions:

- 60% auction ramping to 100% in 5 years (8% annual increments)
- Up to 65% of the allowance proceeds shall be directed to the SEU for energy efficiency and renewable energy deployment
- Up to 15% of the allowance proceeds shall be directed to low income consumers through the State weatherization and LIHEAP programs.
- Percentage allocations of funds to the SEU and low income consumers may be reviewed and adjusted annually by a committee comprised of the Secretary of DNREC, who shall serve as committee chairman, the Chair of the SEU, the directors of the state weatherization and LIHEAP programs.
- Up to 10% of allowance proceeds be directed to "Greenhouse Gas Reduction Projects" (the generators had proposed 5%) with the fund controlled by the DNREC Secretary (with an industry and environmental advisory group)
- Up to 10% of allowance proceeds dedicated to DNREC's Administration (off the top)

This recommendation represents the views of a majority of Workgroup members and is not the consensus of all workgroup members. Alternative recommendations and views were discussed as noted above, with this final recommendation receiving support from 14 of the Workgroup's 17 members.

²⁹ Statement by Rep. John Kowalko the workgroup and found at:
<http://www.awm.delaware.gov/Info/Regs/Documents/Rep%20%20Kowalko%20statement%203-9-08.pdf>

Appendix A

Carbon Emissions from RGGI Affected Units 2000-2006³⁰

RGGI Data Extracted from Spreadsheet File DE-2000-2004-rev081905 (2005 and 2006 from file DE-2000-2006-rev100907)

Plant Name	Boiler ID	Gen. ID	Nameplate Capacity (MW)	CO2 Annual Emissions (tons)							Analysis with Premcor RGGI Units			
				2000	2001	2002	2003	2004	2005	2006	2000 - 2002 3-yr. ave.	% of cap per unit	% of cap per facility	Facility Name
Conectiv Edge Moor	3	3	75	669,518	483,482	676,268	542,070	517,907	517,711	454,546	609,756	7.84%	29.50% Conectiv EM	
Conectiv Edge Moor	4	4	176.8	1,105,496	899,033	994,209	1,109,128	1,096,953	948,575	1,109,203	999,580	12.85%		
Conectiv Edge Moor	5	5	446	402,017	1,103,614	547,909	900,277	426,538	543,792	93,217	684,513	8.80%		
NRG Indian River	1	1	81.6	549,707	429,902	364,346	469,594	469,946	465,367	433,208	447,985	5.76%	39.39% Indian River	
NRG Indian River	2	2	81.6	556,788	537,725	366,459	460,831	430,836	427,878	514,194	486,991	6.26%		
NRG Indian River	3	3	176.8	714,936	421,729	442,587	763,239	942,837	958,858	883,299	526,418	6.77%		
NRG Indian River	4	4	442.4	1,679,439	1,603,171	1,522,983	1,310,828	1,751,566	2,018,423	1,741,767	1,601,864	20.60%	1.99% McKee Run	
City of Dover McKee Run	3	3	113.6	129,576	181,762	152,796	112,284	100,484	88,831	17,409	154,711	1.99%		
Conectiv Hay Road	1	1	115	148,105	219,522	168,066	150,140	163,792	183,883	97,845	178,564	2.30%		
Conectiv Hay Road	2	2	115	157,366	212,383	190,476	146,448	169,193	151,871	103,366	186,742	2.40%	13.09% Conectiv HR	
Conectiv Hay Road	3	3	115	137,300	222,711	219,733	171,663	174,525	185,838	119,957	193,248	2.49%		
Conectiv Hay Road	4	4	115	0	0	0	0	0	0	0	0	0.00%		
Conectiv Hay Road	5	5	122	not operating	33,503	266,079	93,833	98,333	107,030	51,605	149,791	1.93%	0.07% Van Sant	
Conectiv Hay Road	6	6	122	not operating	43,511	261,451	91,502	102,951	117,023	88,379	152,481	1.96%		
Conectiv Hay Road	7	7	122	not operating	46,302	267,539	90,479	95,756	103,057	52,973	156,921	2.02%		
Conectiv Hay Road	8	8	122	not operating	0	0	0	0	0	0	0	0.00%	0.18% Beasley	
City of Dover Van Sant	11	1	45.1	4,276	6,423	5,170	2,751	2,365	4,699	2,231	5,290	0.07%		
Warren F. Beasley Station	1	1	45	not operating	not operating	13,946	15,874	13,518	13,600	10,212	13,946	0.18%		
NRG Energy Center Dover	2	2	50	not operating	15,570	5,365	3,299	5,064	8,333	2,922	10,468	0.13%	0.25% NRG Dover	
NRG Energy Center Dover	3	3	50	not operating	14,089	4,427	7,265	4,756	6,657	2,470	9,258	0.12%		
Motiva Refinery	BLR1	G1	28	312,687	292,655	288,557	196,359	168,057	159,712	151,168	297,966	3.83%		
Motiva Refinery	BLR2	G2	28	306,097	213,792	176,166	181,839	188,469	208,093	185,286	232,018	2.98%	15.53% Premcor	
Motiva Refinery	BLR3	G3	63	239,436	223,901	276,086	212,835	162,603	202,792	176,017	246,474	3.17%		
Motiva Refinery	DCPP4	G4	63	291,154	347,280	327,715	179,928	192,054	172,638	224,357	322,050	4.14%		
Motiva Refinery	MECCU1	CT1	90	not operating	55,502	84,408	76,559	151,817	318,532	412,932	69,955	0.90%		
Motiva Refinery	MECCU2	CT2	90	not operating	37,740	40,420	126,510	103,832	385,460	581,557	39,080	0.50%		
TOTAL				7,403,897	7,645,302	7,663,163	7,415,535	7,534,152	8,298,653	7,510,121	7,776,069			

Note: for a unit that did not begin operating until 2001 or 2002, the unit's average emissions are based on only those years the unit operated.

³⁰ An Analysis of the RGGI Emissions Cap, available at <http://www.awm.delaware.gov/NR/rdonlyres/703E698E-DA83-4217-950E-F03F96C94573/3123/RGGIEmissionsCapAnalysis22.pdf>

APPENDIX B

State Auction Percentages and Authorizing Statutes/Regulations

State	Tons yr.	Auction Percentage	Special Provisions	Authority
Connecticut:	10,695,036	91%	1% voluntary renewable energy purchases 5% Combined Heat and Power (CHP) set a side 3% CDR	State Statute: http://www.cga.ct.gov/2007/ACT/PA/2007PA-00242-R00HB-07432-PA.htm Proposed Regulation: http://www.ct.gov/dep/cwp/view.asp?A=2586&Q=401336
Maine:	5,948,902	100%	DEP Commissioner can suspend compliance in the event of excessive economic impacts	State Statute: http://janus.state.me.us/legis/ros/lom/LOM123rd/PUBLIC317.asp Draft Regulations: http://www.maine.gov/dep/air/regulations/proposed.htm
Maryland:	37,503,983	90%	<ul style="list-style-type: none"> • 10 percent set-a-side pool: new sources, offset projects, early reductions, etc • Provision for take back of 50% for direct sale to EGUs at set trigger price 	Proposed Rule: http://www.mde.state.md.us/assets/document/Air/RGGI_Chapters01-03_10-07.pdf
Massachusetts:	26,660,204	99%	<1% set-a-sides for renewable energy purchases and MA Reg 729 compliance	Proposed Rules: MA DEP http://www.mass.gov/dep/service/regulations/proposed/co2regs.pdf DOER regulations http://www.mass.gov/doer/rggi/rggi-prop_doer_co2_regs.pdf

New Hampshire:	8,620,460	100%	Provision for temporary grants to PSNH under existing Clean Power Act of 4,072,000 allowances	Proposed Statute http://www.gencourt.state.nh.us/legislation/2008/HB1434.html
New Jersey:	22,892,730	up to 100%	<ul style="list-style-type: none"> Includes direct sale of allowances at \$2/ton for facilities with current long term contracts executed before January, 2002 Statute includes exemption for facilities and generating units that sell less than 10 percent of their gross electrical generation on an annual basis. 	State Statute: http://www.njleg.state.nj.us/2006/Bills/A5000/4559_U2.PDF
New York:	64,310,805	100%	Includes a voluntary renewable energy market and long term contract set-aside allocation. 700,000 and 1,500,000 tons/year	Proposed DEC Regulation: http://www.de.ny.gov/regulations/36588.html
Rhode Island:	2,659,239	100%		State Statute: http://www.rilin.state.ri.us/PublicLaws/law07/law07206.htm
Vermont:	1,225,830	100%		State Statute: http://www.leg.state.vt.us/statutes/fullsection.cfm?Title=30&Chapter=005&Section=00255

APPENDIX C

RGGI State Laws/Regulations Governing Allowance Revenues

Connecticut

The Department of Environmental Protection, in consultation with the Department of Public Utility Control, shall auction all emissions allowances and invest the proceeds on behalf of electric ratepayers in **energy conservation, load management and Class I renewable energy programs**. In making such investments, the Commissioner of Environmental Protection shall consider strategies that maximize cost effective reductions in greenhouse gas emission”

Public Act No. 07-242

- 7.5% retained by Commissioner
- 23.125% transferred to Connecticut Clean Energy Fund to support the development of Class I renewable energy sources;
- 69.375% transferred to Connecticut Light & Power (CL&P) - 80% of subtotal and United Illuminating (UI) -20% of subtotal. Proceeds are to be used to support the development of energy efficiency measures

Rhode Island

The proceeds from the auction or sale of the allowances shall be used for the benefit of energy consumers through investment in the most cost-effective available projects that can reduce long-term consumer energy demands and costs. Such proceeds may be used only for the following purposes, in a proportion to be determined annually by the Office (of Energy Resources) in consultation with the (Energy Efficiency and Resources Management) Council and the Department (of Environmental Management):

- promotion cost-effective **energy efficiency and conservation**;
- promotion of cost-effective **renewable non-carbon emitting energy** technologies as defined in Rhode Island general law section 39-26-5.
- cost-effective **direct rate relief** for consumers;
- direct rate relief for **low-income consumers**;
- (5)Administration

RI Law 23-82

Vermont

In order to provide the maximum long-term benefit to Vermont electric consumers, particularly benefits that will result from accelerated and sustained investments in **energy efficiency and other low-cost, low-carbon power system investments**, the public service board, by rule or order, shall establish a process to allocate 100 percent of the Vermont statewide budget of tradable power sector carbon credits and the proceeds from the sale of those credits...”

30 VSA Section 254

New Jersey

- There is established in the Department of the Treasury a special, non-lapsing fund to be known as the “**Global Warming Solutions Fund.**” The fund shall be administered by the State Treasurer and shall be credited with moneys received as a result of any sale, exchange or other conveyance of allowances through a greenhouse gas emissions allowance trading program;
- Sixty percent shall be allocated to the New Jersey Economic Development Authority to provide grants and other forms of financial assistance to commercial, institutional, and industrial entities to support **end-use energy efficiency projects** and new, efficient electric generation facilities that are state of the art, as determined by the department, including but not limited to **energy efficiency and renewable energy applications, to develop combined heat and power production and other high efficiency electric generation facilities, and to stimulate or reward investment in the development of innovative carbon emissions abatement technologies** with significant carbon emissions reduction or avoidance potential.
- The authority, in consultation with the board and the department, shall determine: (a) the appropriate level of grants or other forms of financial assistance to be awarded to individual commercial, institutional, and industrial sectors and to individual projects within each of these sectors;
- Twenty percent shall be allocated to the board to support programs that are designed to reduce electricity demand or costs to electricity customers in the **low-income and moderate-income residential sector**
- Ten percent shall be allocated to the department to support programs designed to promote **local government efforts to plan, develop and implement measures to reduce greenhouse gas emissions**
- Ten percent shall be allocated to the department to support programs that enhance the **stewardship and restoration of the State’s forests and tidal marshes**
- The department may use up to four percent of the total amount in the fund each year to pay for **administrative costs**

P.L.2007, c.112 (C.26:2C-37 et seq.).

Maine

- The **Maine Energy Conservation Board**, as established in Title 5, section 12004-I, subsection 20-B and referred to in this section as "the board," is created to assist the commission and the trustees of the Energy and Carbon Savings Trust in the development, coordination and integration of planning for the State's energy conservation efforts
- The Energy and Carbon Savings Trust and the Energy and Carbon Savings Trust Fund are established effective July 1, 2008 to support the goals and implementation of the carbon dioxide cap-and-trade program.
- There is established a ceiling on energy efficiency spending from the trust equal to \$5 per carbon dioxide allowance

- During the years 2009, 2010 and 2011, not less than 85% of the trust fund must be allocated for **measures, investments and arrangements that reduce electricity consumption**, and not more than 15% must be allocated for **fossil fuel conservation measures**, investments and arrangements
- The trust may fund research approved by DEP in an amount of up to \$100,000 per year to develop new categories of offset projects.
- No more than 5% of trust fund receipts in any one year may be used for the total administrative costs.

MRSA §12004-G, sub-§13-F

Massachusetts

- Proceeds of such auctions shall be deposited into the Division’s Credit Trust Account and shall thereafter be available for expenditure by the Division subject to the approval of the Secretary of the Executive Office of Energy and Environmental Affairs (Secretary).
- The Division shall annually convene an advisory group of stakeholders representing a broad array of energy and environmental interests to advise it on how best to utilize said funds. After such consultation, the Division shall annually report recommendations for such expenditures to the Secretary for approval.
- Recommendations shall seek to achieve the goals of **cost minimization to electricity customers and the promotion of energy efficiency, reliability, demand response, peak shaving (the reduction of peak energy usage), and other strategic energy goals** of the Commonwealth.
- No more than 1% of the annual auction revenue can be used for administrative costs.

MA 225 CMR 13.00 (Proposed)

Maryland:

“**Consumer energy efficiency account**” means a general account established by the Department from which allowances will be sold or distributed in order to provide funds to encourage and foster the following:

- Promotion of **energy efficiency** measures;
- **Direct mitigation of electricity ratepayer impacts** attributable to the implementation of this subtitle;
- **Promotion of renewable or non-carbon-emitting energy technologies;**
- Stimulation or **reward of investment in the development of innovative carbon emissions abatement technologies** with significant carbon reduction potential; and
- **Funding to implement** this subtitle.

MD COMAR 26.09 (Proposed)

New York

- The Department will allocate the CO2 Budget Trading Program base budget to best achieve the emissions reduction goals of the CO2 Budget Trading Program by promoting or rewarding investments in **energy efficiency, renewable or non-carbon-emitting**

technologies, and/or innovative carbon emissions abatement technologies with significant carbon reduction potential.

- NYSERDA administration is expected to be 10% of auction revenues.

Part 242 CO₂ Budget Trading Program (Proposed)

New Hampshire

There is hereby established a greenhouse gas emissions reduction fund appropriated to the public utilities commission to be expended in accordance with this section. Fund monies shall be used to support **energy efficiency, conservation, and demand response programs to reduce greenhouse gas emissions** generated within the state, which may include programs proposed and administered by private entities, as well as by the department, the commission, and other state and local governmental agencies. All programs supported by these funds shall be subject to audit by the public utilities commission as deemed necessary. A portion of the fund monies shall be used to pay for commission and department **costs to administer** this subdivision, including contributions for the state's share of the costs of the RGGI regional organization.”

- Public Utilities Commission will oversee and spend monies in the GHG Emissions Reduction Fund
- Fund monies shall be used to support energy efficiency, conservation, and demand response programs to reduce greenhouse gas emissions generated within the state, which may include programs proposed and administered by private entities, as well as by the department, the commission, and other state and local governmental agencies.
- At least 5% used to assist low-income residential customers to reduce total energy use including heating fuels.
- In selecting programs to be funded under this section the commission shall consider, at a minimum, the extent to which the program:
 - Reduces GHG emissions from all fuels used to provide electricity, heating and cooling in NH;
 - Is likely to be cost-effective;
 - Is expected to reduce NH's peak electric load;
 - Promotes market transformation, innovation, and energy cost savings for public and non-profit entities;

HB 1434 as passed in the NH House March 19, 2008

Appendix D

SCR 28 Workgroup members

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Deputy Secretary, DNREC

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Indian River Generating Station
*Representing NRG Dover

Patrick McCullar
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DEMEC

Cathe Kalisz, P.E.
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Senator Harris McDowell
Chair, Senate Energy and Transit Committee

Senator George Bunting

Arthur Padmor
Delaware Public Advocate

Senator Charles Copeland
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Ex-officio:

Bruce Burcat
Executive Director
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Verne Shortell
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Tony DiPrima
City Manager
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Dr. John Bryne
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Stuart Widom
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Representative Gerald Hocker
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Representative Pam Thornburg

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Chad Tolman
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