# Memorandum

TO: THE SCIENCE, TECHNOLOGY AND ENERGY COMMITTEE ON BEHALF OF:

SUSAN W. CHAMBERLIN, CONSUMER ADVOCATE

NEW HAMPSHIRE OFFICE OF CONSUMER ADVOCATE

BY: ELIZABETH A. STANTON AND PAT KNIGHT, SYNAPSE ENERGY ECONOMICS, INC.

DATE: JANUARY 22, 2015

RE: TESTIMONY IN OPPOSITION TO HB 208 REPEALING THE NEW HAMPSHIRE REGIONAL GREENHOUSE GAS INITIATIVE

New Hampshire House Bill 208-FN (HB 208-FN), introduced on January 7, 2015 by Representatives Barry, Moore and Notter, would end the state's participation in the Regional Greenhouse Gas Initiative (RGGI) effective (retroactively) on December 31, 2014.

An exit from RGGI would result in higher bills for New Hampshire consumers and would eliminate the least expensive way for New Hampshire to comply with upcoming federal regulations.

## What RGGI Means for New Hampshire

RGGI requires power plants in nine participating states to purchase an "allowance" for each ton of carbon dioxide ($CO_2$) emitted. Each RGGI state receives a set share of the proceeds from the auction of allowances. RGGI impacts electric customers in two critical ways: (1) higher rates due to the cost of New England-wide RGGI allowances; and (2) lower bills and rates due to spending from RGGI auction proceeds. Studies of RGGI's economic impacts on New Hampshire find that the spending from RGGI proceeds outweighs rate impacts from the cost of allowances, resulting in a net benefit to consumers.

### Higher rates due to the cost of RGGI allowances

New Hampshire electric consumers pay for RGGI allowances whether or not New Hampshire participates in the initiative.

Power plants are dispatched (that is, required to run) in order of their cost of generation, starting with the least expensive plants and adding on increasingly more expensive plants as needed to generate sufficient electricity hour by hour. The electric rates paid by customers depend on the cost of generation at the most expensive power plant (called the "marginal plant") needed to supply the region's demand for electricity, which in New England is almost always a natural gas combined cycle generator. The price

to customers reflects the cost of the marginal unit's generation, including its required purchase of RGGI allowances.

Because New Hampshire is part of the New England electric system, the state's electric consumers pay a premium on their electric rates regardless of whether or not New Hampshire participates in RGGI. As long as the price-setting generator is required to buy RGGI allowances, New Hampshire customers pay for this cost in their rates.[1] If New Hampshire leaves RGGI, there may be some hours in the year in which a New Hampshire generator is the marginal plant and no one in New England pays for a RGGI allowance. However, with New Hampshire responsible for just 9 percent of the region's 2014 natural gas combined cycle generation, New Hampshire's exit from RGGI is unlikely to have a large effect on the wholesale cost of energy.[2]

### Lower bills and rates due to spending from RGGI auction proceeds

New Hampshire electric consumers only receive economic benefits from RGGI if the state participates in auctions and receives allowance revenues.

New Hampshire's expected revenue from RGGI auctions is $18 million in 2015 rising to $43 million in 2021 and years thereafter. Of this, $1 for every allowance sold by New Hampshire is reserved for energy efficiency expenditures, and the remainder is rebated to electric consumers on an equal per kilowatt-hour basis. In 2015, for example, $14.8 million dollars would be rebated to customers and $3.5 million would be spent on efficiency programs. Energy efficiency spending from New Hampshire's RGGI revenues is allocated as follows:[3]

- 15 percent to fund low-income energy efficiency programs (in 2015, $0.5 million)
- $2 million to fund municipal and local government energy efficiency projects
- The remaining amount (in 2015, $0.9 million) funds other energy efficiency programs in the state

Rebates to customers directly lower electric rates and, therefore, customers' bills. Energy efficiency programs reduce customers' energy usage and, therefore, their bills. New Hampshire's RGGI revenues provide funding for state and municipal programs that, were the statute to be repealed, would require a different source of revenue (e.g., increased property taxes).

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[1] Gittell and Magnusson (2008) *Economic Impact in New Hampshire of the Regional Greenhouse Gas Initiative (RGGI): An Independent Assessment*. University of New Hampshire, Whittemore School of Business and Economics. p.29. http://des.nh.gov/organization/divisions/air/tsb/tps/climate/rggi/documents/unh-rggi-study.pdf

[2] U.S. EIA Form 923, 2014

[3] NH Department of Environmental Services (October 21, 2014) "Re: RSA 125-O:21 RGGI annual report required of the Department of Environmental Services (DES) and the Public Utilities Commission (PUC)". http://www.puc.nh.gov/Sustainable%20Energy/GHGERF/RGGI%20Annual%20Reports/2014%20RGGI%20Annual%20Report%20to%20NH%20Legislature.pdf

A New Hampshire withdrawal from RGGI will not provide net benefits to New Hampshire consumers; instead, consumers will continue to pay for non- New Hampshire marginal generation units dispatched by ISO New England and lose the annual revenues from the RGGI allowances for a net cost to the state's consumers that will increase their monthly electric bills. In order to avoid paying for non- New Hampshire marginal generation units dispatched by ISO New England, New Hampshire would need to withdraw from the New England grid and lose the substantial benefits (primarily reserve sharing) provided by a six-state integrated electric system. This would put reliable electric service for New Hampshire residents and businesses at great risk and probably produce a net increase in costs to New Hampshire ratepayers in order to maintain current levels of reliable service. Alternatively, New Hampshire could  try to develop an elaborate accounting mechanism to separate the physical flows of energy through an integrated grid from the financial transactions paying for those flows; even if successful in developing such a mechanism, New Hampshire would need to persuade ISO New England to adopt and integrate the New Hampshire mechanism into its existing dispatch and accounting systems, which would require substantial time and effort by ISO New England that would be billed to New Hampshire and paid by New Hampshire consumers. Choosing an isolationist electricity policy for New Hampshire is not very practical and probably very expensive.

## RGGI Benefits New Hampshire Electric Customers

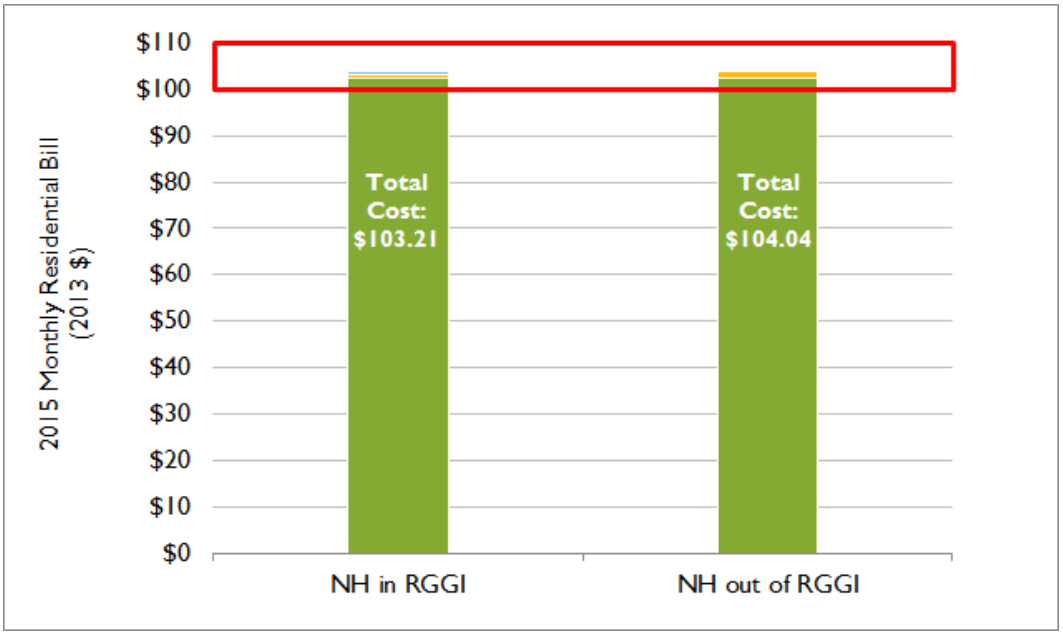
Exiting RGGI would cost New Hampshire consumers.

RGGI is expected to add an average of $1.70 to monthly residential electric bills in 2015, rising to $3.40 in 2020 and years thereafter. Because changes to the impact on electric customers' bills from repealing RGGI are expected to be small, this rate increase occurs whether or not New Hampshire participates in RGGI auctions. This bill increase amounts to 0.6 percent of the average monthly residential electric bill (see Figure 21 and While the impact of generators' RGGI allowance purchases on electric rates is expected to vary only slightly if New Hampshire repeals RGGI, the state's revenues from RGGI would cease. Even without any calculation of the impact of RGGI-funded energy efficiency programs on customers' bills, a New Hampshire exit from RGGI would cost the state's average residential consumer $10 in 2015 rising to $25 in 2021 and years thereafter. Figure 3 presents average annual savings to residential electric customers of New Hampshire's participation in RGGI that would be lost if the state discontinues its participation.

Figure 32, which compare average residential electric bills with and without New Hampshire's participation in RGGI; While the impact of generators' RGGI allowance purchases on electric rates is expected to vary only slightly if New Hampshire repeals RGGI, the state's revenues from RGGI would cease. Even without any calculation of the impact of RGGI-funded energy efficiency programs on customers' bills, a New Hampshire exit from RGGI would cost the state's average residential consumer $10 in 2015 rising to $25 in 2021 and years thereafter. Figure 3 presents average annual savings to residential electric customers of New Hampshire's participation in RGGI that would be lost if the state discontinues its participation.

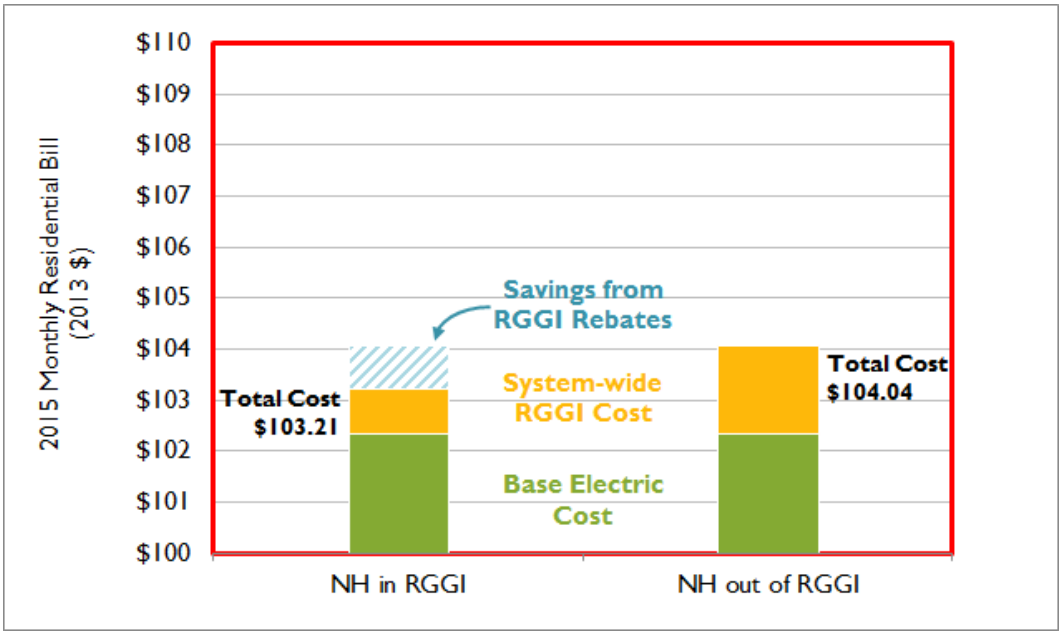
Figure 32 zooms in on the red box outlined in Figure 21).

**Figure 1. 2015 New Hampshire residential electric bills**




*Data sources: EIA 826 2013, AESC 2013, AEO 2014, RGGI.org, NH PUC*

**Figure 2. 2015 New Hampshire residential electric bills: detail**




*Data sources: EIA 826 2013, AESC 2013, AEO 2014, RGGI.org, NH PUC*

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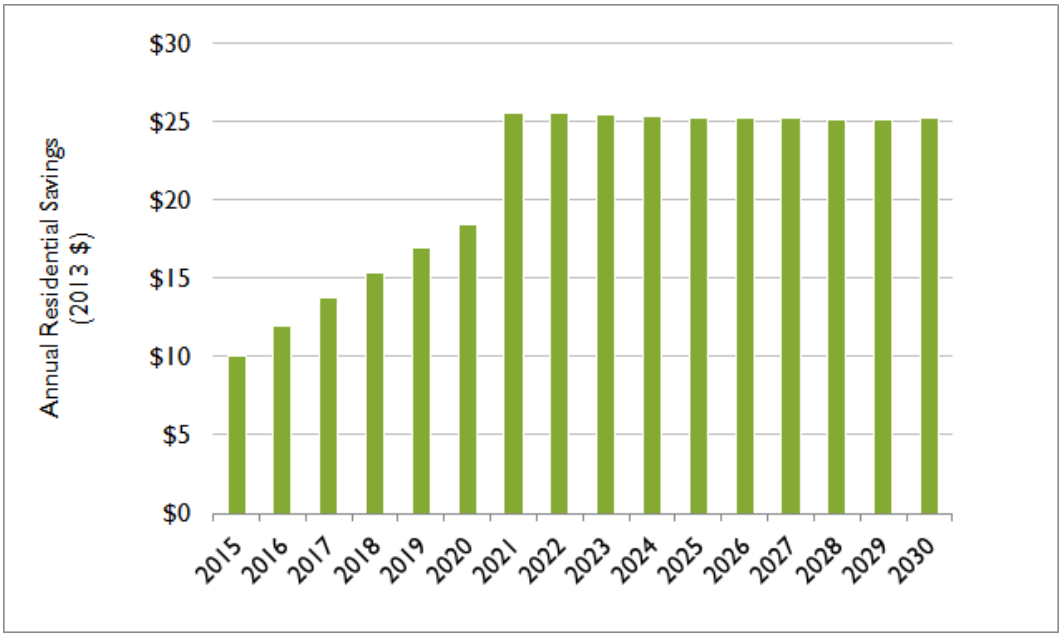
**Figure 3. Change in New Hampshire residential electric bills from loss of RGGI rebate, 2015 to 2030**




*Data sources: EIA 826 2013, AESC 2013, AEO 2014, RGGI.org, NH PUC*

These conclusions are supported by analysis conducted at several other institutions. Researchers at the University of New Hampshire investigated RGGI's impact on the state economy in 2008.[4] Their study found that, "[i]t is in the economic interest of the state of New Hampshire to participate in the Regional Greenhouse Gas Initiative (RGGI)…Electricity costs will increase in New Hampshire even if the State were not to participate in RGGI. This is because all of the utilities in the State purchase competitively generated power from the New England marketplace. If New Hampshire were not to join RGGI, it would not receive the economic value from the allowances allocated to it under RGGI, but would still experience the increased cost of RGGI in regional wholesale power prices."

A 2011 study by the Analysis Group tracked the impacts of the first three years of RGGI implementation and found that the regional program brought added revenues, new jobs, and lower consumer electric bills to New Hampshire.[5] According to this report, "Based on the initial three years of experience from the nation's first mandatory carbon control program, market-based programs are providing positive economic impacts while meeting emission objectives. The pricing of carbon in Northeast and Mid-

[4] Gittell and Magnusson (2008) *Economic Impact in New Hampshire of the Regional Greenhouse Gas Initiative (RGGI): An Independent Assessment*. University of New Hampshire, Whittemore School of Business and Economics. http://des.nh.gov/organization/divisions/air/tsb/tps/climate/rggi/documents/unh-rggi-study.pdf

[5] Hibbard et al. (2011) *The Economic Impacts of the Regional Greenhouse Gas Initiative on Ten Northeast and Mid-Atlantic States*. Analysis Group. http://www.analysisgroup.com/uploadedfiles/publishing/articles/economic_impact_rggi_report.pdf

Atlantic electricity markets has been seamless from an operational point of view and successful from an economic perspective."

The New Hampshire Department of Environment Services' (DES's) latest annual report on RGGI to the state legislature, submitted October 21, 2014, found that, to date, the state had received $73 million in allowance auction revenue over the period of its six year participation in RGGI.[6] In an addendum to HB 2008-FN, the New Hampshire Public Utilities Commission (PUC) and DES state that this bill will decrease state-restricted revenues and expenditures each year, from $8 million in fiscal year 2015 up to $28 million in fiscal year 2018, and will decrease local revenue by $2 million in fiscal year 2015 and each year thereafter.

## RGGI Benefits both PSNH and Non-PSNH Customers

New Hampshire's participation in RGGI impacts PSNH and Non-PSNH customers differently, but both groups benefit from RGGI auction revenues.

While it is more difficult to estimate PSNH customers' net economic impact from the repeal of RGGI, the DES's 2014 report on RGGI to the state legislature notes that, "The cost of $CO_2$ allowances is a very small part of overall electricity bills… PSNH's net compliance cost excluding PSNH's portion ($6.760 million) of the RGGI allowance refund is $1.414 million for 2013, or $0.000375 per kWh…, which translates to 24 cents per month, or 0.22% for a household using 650 kWh. This small rate impact is offset by strategic reinvestment of $CO_2$ allowance proceeds in energy efficiency measures which reduce demand for electricity and give households and businesses better control over their electric bills."[7]

## RGGI Funds Energy Efficiency, Lowering Customers Bills Still Further

Part of New Hampshire's RGGI revenues are spent on energy efficiency measures that lower energy usage and energy bills. The 2011 Analysis Group study draws attention to the ways in which different uses of RGGI allowance proceeds have different impacts on state economies. They found that "investments in energy efficiency lead to positive economic impacts; this reinvestment thus stands out as the most economically beneficial use of RGGI dollars." [8]

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[6] NH Department of Environmental Services (October 21, 2014) "Re: RSA 125-O:21 RGGI annual report required of the Department of Environmental Services (DES) and the Public Utilities Commission (PUC)". http://www.puc.nh.gov/Sustainable%20Energy/GHGERF/RGGI%20Annual%20Reports/2014%20RGGI%20Annual%20Report%20to%20NH%20Legislature.pdf

[7] NH Department of Environmental Services (October 21, 2014) "Re: RSA 125-O:21 RGGI annual report required of the Department of Environmental Services (DES) and the Public Utilities Commission (PUC)". http://www.puc.nh.gov/Sustainable%20Energy/GHGERF/RGGI%20Annual%20Reports/2014%20RGGI%20Annual%20Report%20to%20NH%20Legislature.pdf

[8] Hibbard et al. (2011) *The Economic Impacts of the Regional Greenhouse Gas Initiative on Ten Northeast and Mid-Atlantic States*. Analysis Group. http://www.analysisgroup.com/uploadedfiles/publishing/articles/economic_impact_rggi_report.pdf

Our colleagues at Synapse Energy Economics issued a report on the energy efficiency benefits of RGGI proceeds in 2012.[9] This study found that for every dollar of auction proceeds invested in energy efficiency, states see an average benefit of $2.30: "Our updated analysis finds that incorporating energy efficiency continues to be an integral component of the RGGI program, and results in $CO_2$ emissions reductions at a much lower cost to consumers than other approaches…Lessons from the RGGI program may be applied to the development of a federal cap-and-trade program. Investments of auction proceeds in energy efficiency programs continue to yield benefits that far exceed the initial investment."

## RGGI is the Least Expensive Way for New Hampshire to Comply with the Clean Power Plan

RGGI allows New Hampshire to cost-effectively comply with mandatory federal environmental regulations.

In June 2014, the U.S. Environmental Protection Agency (EPA) released a proposal called the Clean Power Plan to reduce nationwide $CO_2$emissions for 2020 through 2030. In the Clean Power Plan, EPA developed state-by-state compliance targets by assuming each state implements each of the following strategies in a similar way:

1. Reducing the emissions rate of $CO_2$ at existing coal-powered units;
2. Creating a mechanism so that natural gas-powered units become less expensive to operate compared to coal-powered units;
3. Accounting for the non-retirement of existing and new nuclear units;
4. Implementing new renewable energy programs; and
5. Implementing new energy efficiency programs.

Each state may comply with the EPA-specified target by using a combination of the above strategies, or by using other strategies entirely.

In its rulemaking, EPA is also allowing for states to comply by coming together. EPA developed state targets using a consistent methodology. However, each state is different, so compliance for some states will be less costly than for others. Because of this, states that team together by using "multi-state" compliance may achieve efficiencies in costs of compliance with the Clean Power Plan.

States also have the option of complying with the Clean Power Plan by either measuring tons of emissions (a "mass"-based perspective) or by measuring the statewide emissions rate in tons of $CO_2$ per

[9] Chang et al. (2012) *Energy Benefits Resulting from the Investment of 2010 RGGI Auction Revenues in Energy Efficiency*. Synapse Energy Economics. http://www.synapse-energy.com/sites/default/files/SynapseReport.2012-02.RAP_.RGGI-Energy-Efficiency-Benefits.10-027A.pdf

MWh generated (a "rate"-based perspective).[10] Generally, for states that are complying jointly with other states, mass-based approaches to compliance are considered easier to implement.

RGGI is one of the examples EPA used when it developed the "multi-state" compliance concept. DES's 2014 report on RGGI to the state legislature explains RGGI's importance to New Hampshire's ability to cost effectively comply with this proposed rule:[11]

> EPA's proposed Clean Power Plan to reduce carbon emissions from the electric sector designates energy efficiency programs as one means of meeting the proposed emissions requirements. To comply with this Plan, DES will have to submit a State Plan demonstrating projected compliance, which will likely require greater levels of energy efficiency in New Hampshire…
>
> Rather than comply with EPA's [emission-]rate-based requirement, existing power plants may prefer a more flexible alternative compliance program like RGGI. Power plants are familiar with similar programs for other pollutants. Other non-RGGI states may seek to implement RGGI, or RGGI-like programs, as an alternative to the federal guidelines, rather than implement a rate-based approach. Thus the geographic area for RGGI could be expanded, consistent with the original intent of RGGI. Some states may consider a carbon tax as an alternative compliance mechanism to the federal guidelines. In order to effectively reduce emissions, a carbon tax would need to be greater than $20/ton. RGGI allowance prices are currently below $5/ton.

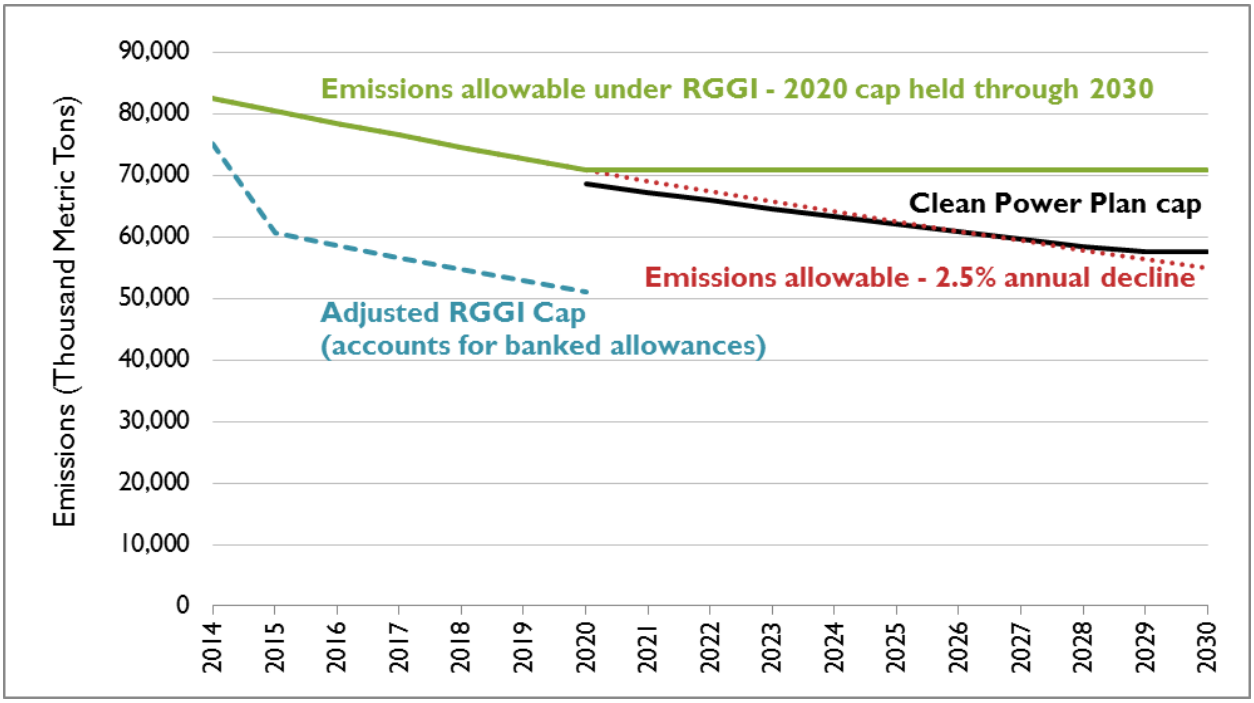
RGGI's $CO_2$ allowance trading is one mechanism a state could use to cause lower-emitting natural gas-powered units to be dispatched more frequently than higher-emitting coal-powered units.

Figure 4 illustrates what Clean Power Plan compliance would mean for the nine states that comprise RGGI, and how this compliance target compares to the RGGI cap.

[10] Note that emissions from coal, existing natural gas, and oil units and generation from coal, existing natural gas, oil, energy efficiency, and renewable energy, and a part of nuclear are included in the EPA's rate-based calculation. The mass-based calculation includes all emissions from all emitting units in each state in each year.

[11] NH Department of Environmental Services (October 21, 2014) "Re: RSA 125-O:21 RGGI annual report required of the Department of Environmental Services (DES) and the Public Utilities Commission (PUC)". http://www.puc.nh.gov/Sustainable%20Energy/GHGERF/RGGI%20Annual%20Reports/2014%20RGGI%20Annual%20Report%20to%20NH%20Legislature.pdf

**Figure 4. Comparison of RGGI caps to Clean Power Plan targets, nine-state region**




The green line in Figure 4 indicates the allowable emissions for all nine states under RGGI (in thousands of metric tons of $CO_2$). The adjusted RGGI cap accounting for banked allowances is also shown as a blue dashed line for reference. The green RGGI cap can be compared to the black line which represents the sum of the Clean Power Plan mass-based targets for the nine RGGI states. The Clean Power Plan is more stringent than the current RGGI cap; by 2030, the RGGI cap allows for more than 13 million metric tons in $CO_2$emissions each year compared to the Clean Power Plan cap. Currently, the RGGI cap declines 2.5 percent per year until 2020, at which point it remains constant.

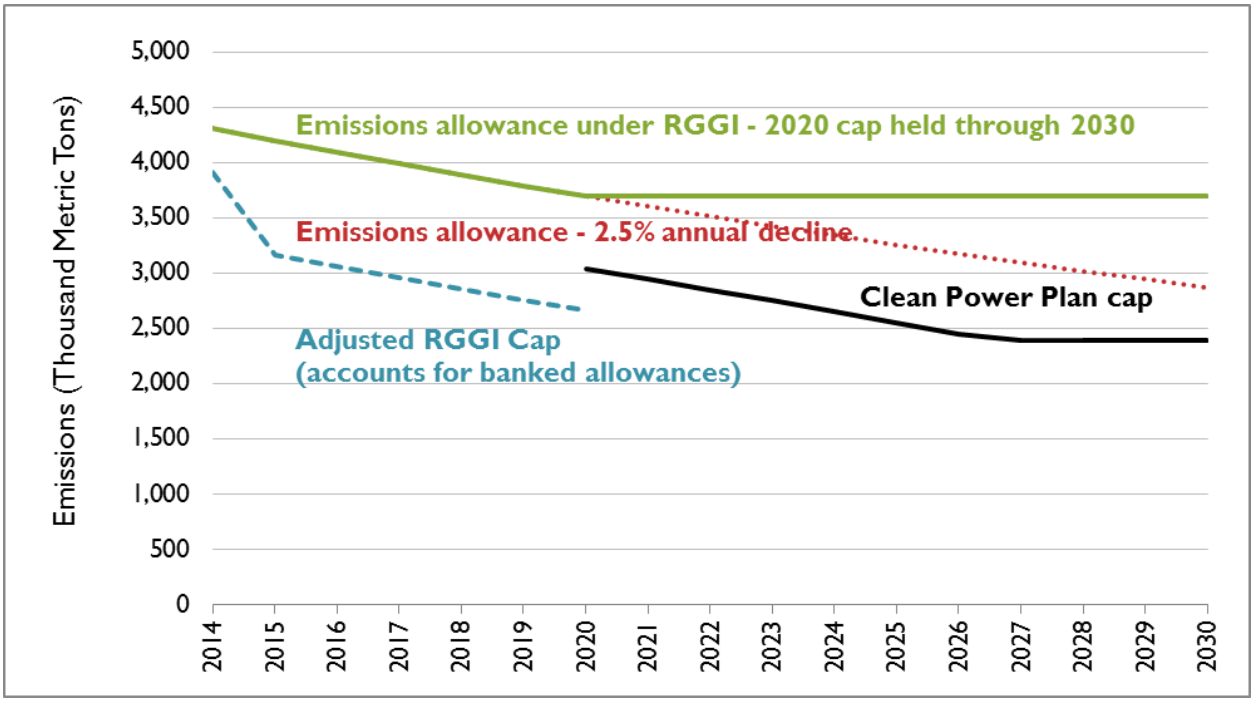
If this annual decline were to continue through 2030 (shown in Figure 4 as the red dotted line), the emissions allowable under RGGI would nearly match the Clean Power Plan cap, potentially allowing a mechanism and pathway for the nine RGGI states to comply with the Clean Power Plan.

Figure 5, below, is analogous to Figure 4, but for New Hampshire only. The green line in this figure represents New Hampshire's share of RGGI allowances through 2030, the blue dashed line is the adjusted New Hampshire allowances (for reference), the black line is New Hampshire's Clean Power Plan mass-based target, and the red dotted line represents a hypothetical RGGI allowance cap for New Hampshire wherein the RGGI emissions cap continues to decline by 2.5 percent per year.[12] In contrast to the nine-state region in Figure 4, the New Hampshire's state-specific RGGI cap is 55 percent greater than the Clean Power Plan cap in 2030. Even if the RGGI cap were tightened by 2.5 percent per year through

[12] Note that in this figure, we have assumed New Hampshire's in-state emissions and the RGGI allowances it receives are identical. While this is true for the nine-state region illustrated in Figure 5, New Hampshire's in-state emissions and its allowances may differ significantly.

2030, the New Hampshire-specific RGGI cap would still exceed the New Hampshire-specific Clean Power Plan cap by 20 percent.

**Figure 5. Comparison of RGGI caps to Clean Power Plan targets, New Hampshire**




In summary, were New Hampshire to stay in RGGI, it would find compliance with the Clean Power Plan far more difficult as a single state than as part of the nine-state region.

If New Hampshire were to leave RGGI, it would need to find its own path to Clean Power Plan compliance. Synapse has developed a tool called the Clean Power Plan Planning Tool (CP3T) to explore different scenarios for state-by-state compliance with the Clean Power Plan.[13] For this report, we analyzed three scenarios for New Hampshire. These scenarios assume New Hampshire leaves RGGI and as such, there is no market-based mechanism available for natural gas-fired generation to displace coal-fired generation.

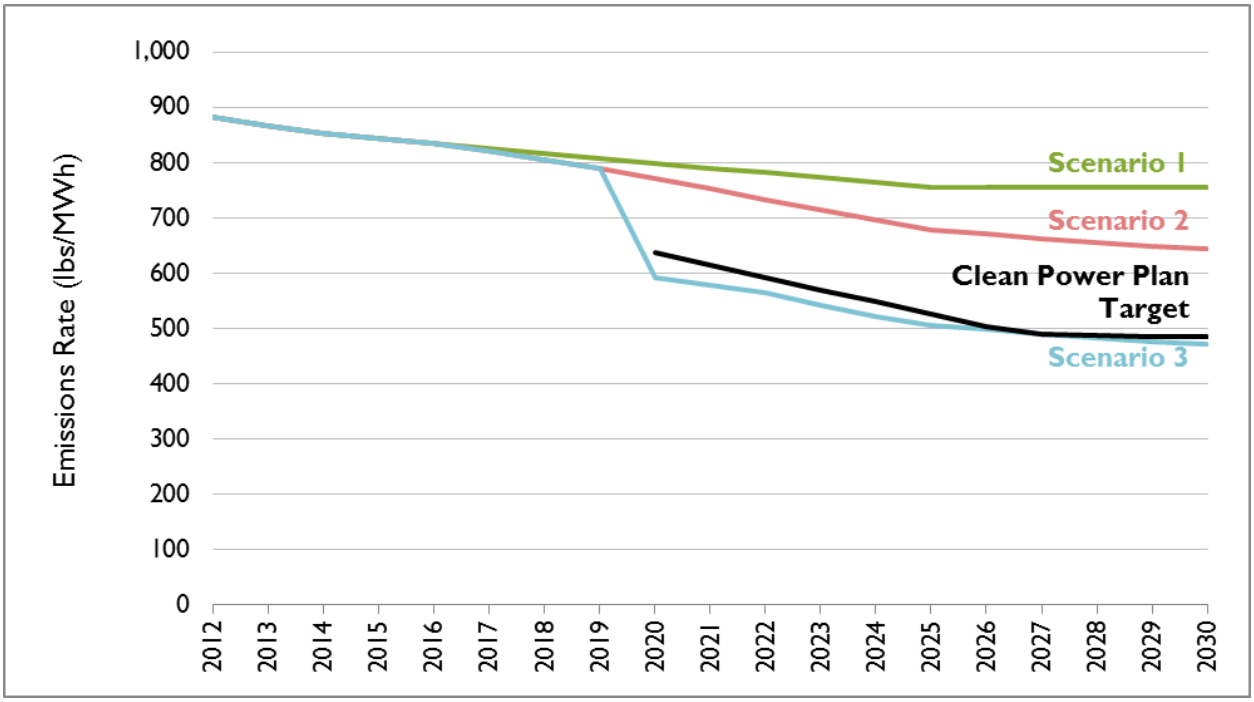
1. **Scenario 1:** New Hampshire only acquires the amount of renewable energy required for it to meet its in-state renewable portfolio standard (RPS) target. This scenario does not achieve Clean Power Plan compliance.
2. **Scenario 2:** New Hampshire acquires the amount of renewable energy required for it to meet its in-state RPS target, and expands energy efficiency programs to the level used by EPA in its development of the Clean Power Plan. This scenario also does not achieve compliance with the Clean Power Plan.

[13] http://www.synapse-energy.com/tools/clean-power-plan-planning-tool-cp3t

3. **Scenario 3:** In this scenario, New Hampshire acquires the RPS level of renewable energy, builds the EPA level of energy efficiency, and also retires all its coal-fired power plants (Schiller 4, Schiller 5, Merrimack 1, and Merrimack 2) by 2020. This scenario achieves compliance with the Clean Power Plan.

Figure 6 depicts the statewide emission rates resulting from each of the above scenarios, compared to the Clean Power Plan target for emissions rate. Note that these three scenarios do not comprehensively represent all the possible ways for New Hampshire to comply with the Clean Power Plan. For example, additional mechanisms for compliance include a New Hampshire-only carbon tax or RGGI-like cap and trade program. In the absence of New Hampshire-specific market mechanisms, however, it is unlikely New Hampshire will be able to comply with the Clean Power Plan as a single state without significant investments in energy efficiency and mandated coal plant retirements.

**Figure 6. New Hampshire's Clean Power Plan target emissions rate compared to the three scenarios run by Synapse (Scenario 1 – RPS only; Scenario 2 – RPS plus EE; Scenario 3 – RPS plus EE plus full coal retirement by 2020)**




New Hampshire's DES and PUC submitted comments joint comments to EPA on the proposed Clean Power Plan stating that:[14]

> Upon careful review of the proposal, New Hampshire's most likely path to compliance appears to be to continue participating in RGGI, for which a multi-state, mass-based plan may be submitted in accordance with EPA's proposal…it is our belief that NH's

[14] NH DES and PUC (December 1, 2014) *Comments to EPA on Clean Power Plan.*

> participation in RGGI should fully satisfy NH' s compliance obligations based on EPA's current guidance and allowed use of multistate, mass-based programs. DES and the PUC understand that additional technical support materials will need to be provided to demonstrate equivalency between the programs. However, the atmosphere is impacted by total emissions, and simply reducing the rate of emissions may not achieve the result necessary to prevent the most serious impacts of a changing climate. In its Climate Action Plan, New Hampshire has targeted an 80% reduction from 1990 emissions by 2050, because that appears to be the amount of reductions needed to stabilize levels of greenhouse gases in the atmosphere at or below 450 parts per million (ppm). EPA's current proposal means that far greater reductions will have to be achieved post-2030. As noted, the RGGI program actually caps and then further lowers emissions by 2.5% per year from 2015 to 2020, a mechanism that we believe provides a greater level of certainty relative to actual atmospheric C02 concentration. Thus, DES and the PUC support utilizing the most cost effective system for achieving reductions: a mass-based, market-based program (i.e., RGGI).

In addition, New Hampshire DES and PUC submitted comments to the EPA on the proposed Clean Power Plan jointly with the other eight RGGI states, with Northeast States for Coordinated Air Use Management (NESCAUM), and with a consortium of 14 states organized by the Georgetown Climate Center. These comments urge EPA to facilitate states' use of RGGI as a compliance mechanism, and noting that regional programs like RGGI are more cost-effective than single-state approaches.[15]

PSNH and Northeast Utilities also submitted comments to the EPA on the proposed Clean Power Plan. PSNH's comments state that, "RGGI states, including New Hampshire, have publically stated that they anticipate that a regional implementation plan that uses the existing RGGI framework will be the basis for compliance with the region's CPP goals. PSNH fully supports a regional implementation plan that embraces RGGI's core principles."

[15] RGGI States (November 5, 2014; December 2, 2014) *Comments to EPA on Clean Power Plan;* NESCAUM (November 26, 2014) *Comments to EPA on Clean Power Plan; and* Georgetown Climate Center (December 16, 2013; December 1, 2014) *Comments to EPA on Clean Power Plan.*