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Pros and Cons of New Jersey Participation in Regional Greenhouse Gas Initiative: A Literature Review

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Introduction

In 2009, a coalition of states formed a cooperative in order to set a cap on CO_2 emissions, the first mandatory market cap program of its kind in the United States. The states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Vermont and Virginia form the current members of the Regional Greenhouse Gas Initiative (RGGI), with Pennsylvania set to join in 2021. The RGGI aims to reduce CO_2 emissions by setting a regional emissions cap. Each state then holds an auction for CO_2 allowances, which allow fossil fuel power plants to purchase an allowance equal to their CO_2 emissions. The states then reinvests the funds from the auctions into cleaner energy sources. This not only helps reduce CO_2 emission, but also seeks to create jobs within the renewable energy sector. [1]

New Jersey, under former Governor Chris Christie, left the RGGI in 2012, only to rejoin the initiative this year under Governor Phil Murphy. Gov. Christie claimed that the RGGI would have no discernible positive environmental effects and would serve only as an additional cost to the taxpayer.[2] Governor Murphy, however, opposed that decision and said he believes it cost the state millions that could have been invested into cleaner energy sources or initiatives to reduce greenhouse gas emissions.[3] Consequently, rejoining RGGI was a priority for Gov. Murphy since the start of his administration, as he issued the executive order of New Jersey's return to RGGI within the first month of taking office. [4] The aim of this study is to undertake a comparative

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[1] *Regional Greenhouse Gas Initiative (RGGI) - Air Quality, Energy and Sustainability (AQES) | Department of Environmental Protection*, www.state.nj.us/dep/aqes/rggi.html.
[2] Navarro, Mireya. "Christie Pulls New Jersey From 10-State Climate Initiative." *The New York Times*, The New York Times, 27 May 2011,
[3] Governor Murphy Announces Adoption of Rules Returning New Jersey to Regional Greenhouse Gas Initiative. (2019, June 17). Retrieved November 13, 2020, from https://nj.gov/governor/news/news/562019/approved/20190617a.shtml
[4] *Id.*

analysis of the effects of New Jersey's withdrawal from the Regional Greenhouse Gas Initiative and what the implications of rejoining may mean for the state.

Economic Effects of RGGI

The RGGI aims to gradually lower the cap on CO_2 emissions, with a projected 30 percent decrease on the current cap by 2030.[5] This substantial decrease raises skepticism that power plants will increase their prices, and with reduced production may even result in economic decline within the power sector and individual state economies. However, in structuring the RGGI as an auction, the money gained from emission allowances is invested into energy efficient strategies. This is meant to prevent economic decline, and multiple analyses on the economic impact of RGGI concur that it has resulted in economic gains in the power sector industry for each state. This also suggests that New Jersey, in being absent from the RGGI, may have missed out on the possible energy sector improvement.

One of the foremost analyses of RGGI and its economic effect was prepared by the Analysis Group, a consulting firm, which overall assessed a positive net gain for each individual state energy sector. The Analysis Group in Boston is a large independent research firm which has published analyses of RGGI and its economic impact for every three-year compliance period RGGI has set.[6] The cooperative sets emission caps in three-year compliance periods, the first being 2009-2011 and the most recent being 2015-2017. Their comprehensive analysis finds that the RGGI compliance period of 2015-2017 produced a positive impact for all states within the cooperative on a general level, producing economic gains for electricity consumers over time and direct investment of auction proceeds into economic activities.

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[5] *Regional Greenhouse Gas Initiative (RGGI) - Air Quality, Energy and Sustainability (AQES) | Department of Environmental Protection*, www.state.nj.us/dep/aqes/rggi.html.

[6] Hibbard, Paul J, et al. Analysis Group, 2018, pp. 1–47, *The Economic Impacts of the Regional Greenhouse Gas Initiative on Nine Northeast and Mid-Atlantic States*.

Another report conducted by the Congressional Research Service, a public policy research institute of the U.S. Congress, suggests that overall RGGI has produced positive economic gains for all states involved, but to vastly different degrees.[7] The report recognizes that each state within the region differs in the amount of electricity consumed by high carbon emitting sources. For example, Vermont relies primarily on nuclear power and hydroelectricity, whereas Delaware relies heavily on coal burning. Consequently, electricity consumers in Delaware will suffer more sharp increases in electricity prices in comparison to those in Vermont, and such differences contribute to drastically different results in overall economic gain.[8] In comparison, New Jersey relies primarily on natural gas and nuclear energy to fuel its electricity generation; the two sources account for 94% of electricity generated at utility-scale in New Jersey. Whereas nuclear powered energy is emission free, natural gas accounts for more of the state's electricity generation, more so in recent years due to a nuclear power plant closure in 2018.[9] This energy profile breakdown of New Jersey's power sector suggests that, similar to Delaware, it will experience initial sharp increases in electricity power, resulting in less economic gain than it would have experienced prior to 2015, when the majority of electricity generation came from nuclear power. Similar to Vermont, however, the state relies very little on coal consumption for electricity, as a mere 1.5% (2019) of electricity generated is from coal, down from a high of 10% in 2010.[10]

On a state level, research into different individual states still suggests that the RGGI has made a positive economic impact within energy sectors. A report analyzing the economic impact

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[7] Ramseur, Jonathan L. "The regional greenhouse gas initiative: Lessons learned and issues for policy makers." (2014).
[8] *Id,* at 17.
[9] "New Jersey - State Energy Profile Analysis." Energy Information Administration (EIA). U.S. Energy Information Administration - EIA, September 17, 2020. https://www.eia.gov/state/analysis.php?sid=NJ.
[10] *Id.*

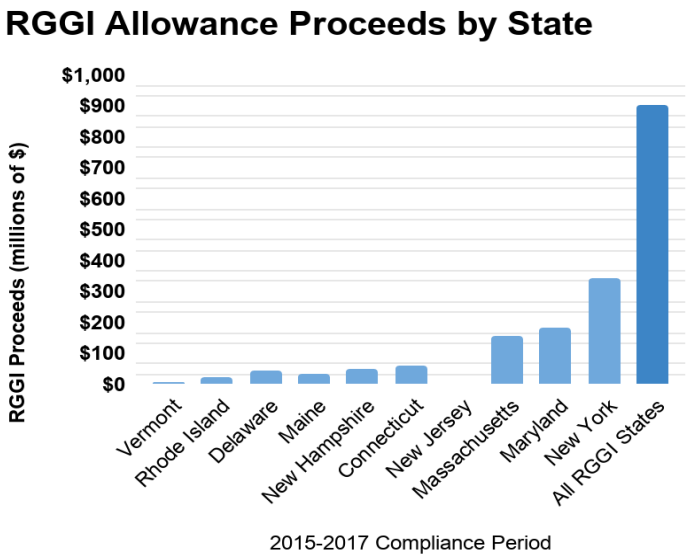
of RGGI within New Hampshire concurs that the economic benefits produced are within the state's best interest.[11] The New Hampshire state legislature has made multiple attempts to leave the RGGI as New Jersey did, but the majority of its representatives have agreed that the economic benefits are substantial enough to remain. A subsequent analysis of the economic effects in New York have found that after its first compliance period, RGGI generated $325 million in net economic benefits.[12] This number has only increased in subsequent compliance periods with lower caps on emissions. Thus the data overwhelmingly support the fact that a climate change policy on reducing emissions can produce a net increase in economic activity within the region, as opposed to the economic decrease that critics have expected.

Much of the literature concludes that economically, New Jersey has lost much in leaving the RGGI. When comparing the Analysis Group's reports from the 2009-2011 (Figure 1) compliance period against the 2015-2017 compliance period (Figure 2), each state (with the exception of Vermont) demonstrates a substantial increase in revenues from the RGGI auctions. An example is Delaware, which received revenue of $22 million from the first RGGI compliance period that almost doubled to $43.4 million in the latest compliance period. Vermont was the only exception and went through a decrease of less than a million dollars. However, as mentioned previously, the majority of Vermont's energy does not rely on CO_2 emitting fossil fuels. New Jersey's first year of revenue from RGGI provided $118 million for reinvestment back into energy efficient resources and the creation of new jobs, well above the average revenue of other states. This speaks to how much revenue could have been acquired if New Jersey had

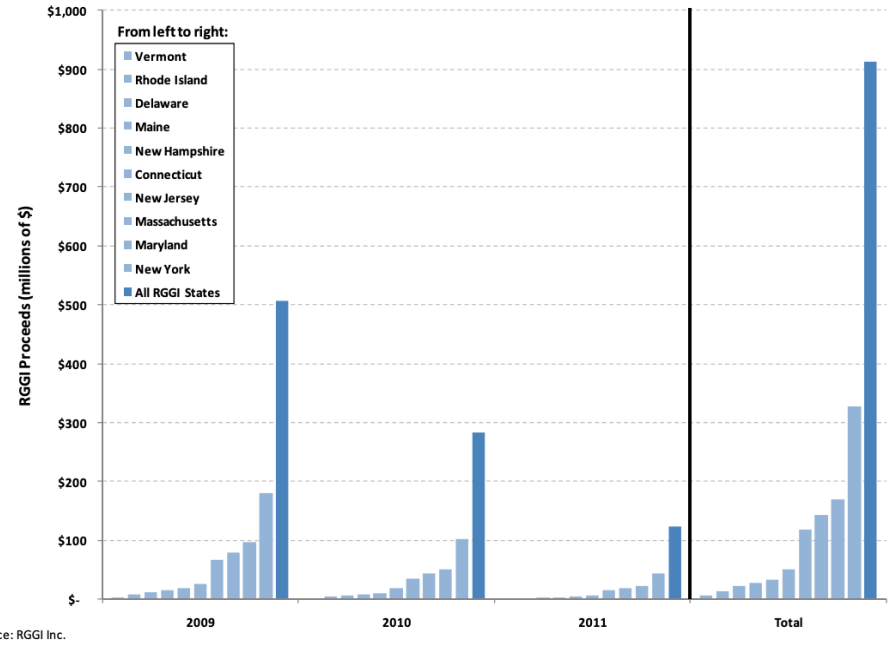
[11] Gittel, Ross, and Matt Magnusson. 2018, pp. 1–69, *Economic Impact in New Hampshire of the Regional Greenhouse Gas Initiative (RGGI): An Independent Assessment*.
[12] Hibbard, Paul J, and Susan F Tierney. *Carbon Control and the Economy: Economic Impacts of RGGI's First Three Years*. The Electricity Journal, 20 Oct. 2011.

stayed within the program. With its rejoining, New Jersey plans to invest $45 million to reduce greenhouse gases produced by the transportation sector. Further, the state plans to use the proceeds to emphasize projects that will benefit environmental justice in certain communities. [13]

Environmental Impacts of RGGI



RGGI Allowance Proceeds by State



Source: RGGI Inc.

[13] Governor Murphy Announces Adoption of Rules Returning New Jersey to Regional Greenhouse Gas Initiative. (2019, June 17). Retrieved November 13, 2020, from https://nj.gov/governor/news/news/562019/approved/20190617a.shtml

With a substantial decrease in allowed emissions from power plants, proponents of the RGGI have applauded its success in reducing overall CO_2 emissions in its respective region. Much of the literature agrees that within the region, the RGGI has produced a net decrease in CO_2 emission since its implementation in 2009. However, there is a small group of critics who refer to the idea of Emission Leakage as a critique on the environmental efficacy of the initiative. Emission Leakage refers to the idea that there are emission sources not being accounted for in the energy sectors of the RGGI states. This leakage could be from imported energy from non-RGGI states. It presents a critical design flaw in measuring CO_2 emissions and their decreases within a state when sources of emission outside a state are being ignored.[14] This emissions leakage presents itself in a few ways. A prime example is if a town or area in an RGGI state borders a non-RGGI state and imports its energy from the non-RGGI state. The design plan only accounts for emissions by in-state power plants, but it does not account for in-state residents consuming out-of-state resources and thus does not take into account all sources contributing to the environmental problem within their states.

The Congressional Research Service found that RGGI states, as a whole, imported between 5 to 11% of their energy from non-RGGI states.[15] A concurring report analyzing emissions leakage found that reduced use of coal in neighboring RGGI states directly corresponded with an increase in coal generation in Pennsylvania.[16] These data confirm that there is an unresolved issue of emissions leakage that the RGGI needs to address. Critics of RGGI will cite emissions leakage as an issue to undermine its effectiveness. However, it should

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[14] Ramseur, Jonathan L. "The regional greenhouse gas initiative: Lessons learned and issues for policy makers." (2014).
[15] *Id,* at pp. 8.
[16] Fell, Harrison, and Peter Maniloff. "Leakage in Regional Environmental Policy: The Case of the Regional Greenhouse Gas Initiative." *Journal of Environmental Economics and Management*, vol. 87, 9 Nov. 2018, pp. 1–23., doi:10.1016/j.jeem.2017.10.007.

be noted that RGGI emission allowances generally do not sell entirely at the set cap. In other words, the initiative sells fewer emission allowances consistently than they have set as a cap for that compliance period. Thus, producing less in emissions than the set cap gives these states some allowances to compensate for the 5% to 11% energy being imported from other states. Literature confirming how much emissions imported energy produces and how it interacts with RGGI emissions could not be found. However, it could still meet the set cap for each respective compliance period.

The emission leakage implications for New Jersey, however, appear to be more optimistic. New Jersey imports only 8% from generators in other states as part of the Pennsylvania, Jersey, Maryland Power Pool (PJM) interconnection. All of its natural gas imports come from Pennsylvania, before shipping amounts of it off to certain New England states.[17] With Pennsylvania set to join NJ and other states as part of the RGGI, Pennsylvania is poised to be working towards reduced emission energy as well. Established natural gas pipelines and PJM power grids generally affirm that most of New Jersey's imported energy that could result in emissions leakage originates in Pennsylvania. Emissions leakage only presents a serious contention to reduced emissions when energy is imported from a non-RGGI state.

In regard to actual carbon emissions, the RGGI regional emissions fell 45 percent below the 10-state cap during the 2009-2011 compliance period. Since leaving the RGGI, New Jersey carbon emissions have continued to increase, from 17 million tons of CO_2 in 2011 to 22 million tons in 2016.[18] In comparison, RGGI states have reduced their regional CO_2 emissions by 25 percent in that period. Rejoining RGGI should put New Jersey close to 2011 levels of emission

[17] "New Jersey - State Energy Profile Analysis." Energy Information Administration (EIA). U.S. Energy Information Administration - EIA, September 17, 2020. https://www.eia.gov/state/analysis.php?sid=NJ.
[18] "Potential Impacts of New Jersey Rejoining RGGI ." Mjbradley.com, M.J. Bradley & Associates, LLC, 19 Jan. 2018, www.mjbradley.com/sites/default/files/MJBA_NJ_Considers_Rejoining_RGGI.pdf.

with the regional cap. The New Jersey Department of Environmental Protection found that during 2007 and 2008, prior to the formation of RGGI, emissions produced by the state's energy sector were 35.6 and 29.9 million tons respectively.[19] After the first RGGI compliance period, New Jersey had managed to reduce energy sector emissions to 17 million tons in 2011 before withdrawing from the initiative. This suggests that the market cap program, within New Jersey specifically, was effective in decreasing the state's individual carbon dioxide emissions. The established mechanisms for the program sets the initial carbon-dioxide cap for the state's electricity generation sector at 18 million tons for 2020. The caps in following years project New Jersey's carbon dioxide budget declining by 30 percent through 2030, with projected emissions to be at 11.3 million tons. [20] This steers the state on the path toward the goal of completely clean energy by 2050.

Carbon dioxide emissions are the primary greenhouse gas emitted through human activities and the primary driver of climate change. Increasing temperatures affect us on a global scale, but the dangers for New Jersey are abundantly clear. As a coastal state, New Jersey is especially vulnerable to rising sea levels. A study by the New Jersey state Department of Environmental Protection predicts that sea level in the state could rise by as much as 2.1 feet by 2050. Eroding coastlines pose a threat to communities by the shore, such as the newly established Stockton community on the shore in Atlantic City. As a state with primarily urban counties, rising sea levels also pose a problem for river and stream flooding in these counties. Thus, reducing carbon emissions and striving towards clean energy is the way to address the problems climate change poses for the state. Reduced carbon emissions could also produce

[19] NJDEP, Office of Climate and Energy. "Statewide Greenhouse Gas Emission Inventory for 2008 ."
[20] Governor Murphy Announces Adoption of Rules Returning New Jersey to Regional Greenhouse Gas Initiative. (2019, June 17). Retrieved November 13, 2020, from https://nj.gov/governor/news/news/562019/approved/20190617a.shtml

health benefits for the residents of New Jersey. More than 300,000 of NJ residents suffer from chronic obstructive pulmonary disease, which is linked to more hospital visits with increases in carbon pollution levels.[21]

Conclusion

With regard to state specific findings, this study concludes that overall, New Jersey's withdrawal from the RGGI in 2012 reduced state revenue and led to higher emissions. The state's natural gas usage in producing electricity surpassed nuclear power in 2015, a move that may not have happened if the state had remained within the cooperative and abided by emission caps. Further, the economic gains and increases in emission auction revenues to each state within the RGGI provides compelling evidence that had New Jersey remained, it too would have invested millions in auction revenues into cleaner energy in the two compliance periods between 2012-2017. Analysis comparing states' individual energy profiles to New Jersey's suggests that rejoining would cause an initial spike in electricity prices that would level out, similar to other states that rely heavily on natural gas, such as Delaware. The data ought t quell critics who believed that financially, the cooperative did not produce net economic gains for the state; but further they also dispel critics who cite emissions leakage as a source of misplaced optimism in the efficacy of RGGI in reducing carbon emissions.

What is clear is that CO_2 emissions are a primary cause of the climate change crisis. The RGGI states alone account for 418 million metric tons of CO_2 emissions, which is on par with Australia, which produces 424 million metric tons of CO_2 emissions.[22] The major significance of

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[21] Baussan, Danielle. "How Leaving RGGI Leaves New Jersey Behind." *Center for American Progress*, 24 July 2014, www.americanprogress.org/issues/green/news/2014/07/24/94371/how-leaving-rggi-leaves-new-jersey-behind/.

[22] Ramseur, Jonathan L. "The regional greenhouse gas initiative: Lessons learned and issues for policy makers." (2014).

the initiative then does not lie in the positive economic effects produced but rather in the environmental ones. In comparing carbon emissions prior to RGGI, during, and after New Jersey's withdrawal, the data suggest that the market cap did produce a significant decrease in emissions and withdrawing led to a resurgence of emissions. As the first program of its kind in the U.S., it does not only help New Jersey environmentally and economically, but also provides a feasible climate action model for other states to implement. The cooperative addresses the main concern of strict climate policy critics, that restrictions on emissions hinder growth. With RGGI proving the opposite to be true, the positives provide hope for a greener future.

Bibliography

Baussan, Danielle. “How Leaving RGGI Leaves New Jersey Behind.” *Center for American Progress*, 24 July 2014, www.americanprogress.org/issues/green/news/2014/07/24/94371/how-leaving-rggi-leaves-new-jersey-behind/.

“DEP PRESENTS NEW STUDY PREDICTING DRAMATIC INCREASE IN SEA-LEVEL RISE ALONG JERSEY SHORE BY 2050.” NJDEP. State of New Jersey Department of Environmental Protection, December 19, 2019. https://nj.gov/dep/newsrel/2019/19_0098.htm.

Fell, Harrison, and Peter Maniloff. “Leakage in Regional Environmental Policy: The Case of the Regional Greenhouse Gas Initiative.” *Journal of Environmental Economics and Management*, vol. 87, 9 Nov. 2018, pp. 1–23., doi:10.1016/j.jeem.2017.10.007.

Gittel, Ross, and Matt Magnusson. 2018, pp. 1–69, *Economic Impact in New Hampshire of the Regional Greenhouse Gas Initiative (RGGI): An Independent Assessment*.

“Governor Murphy Announces Adoption of Rules Returning New Jersey to Regional Greenhouse Gas Initiative,” June 17, 2019. https://nj.gov/governor/news/news/562019/approved/20190617a.shtml.

Hibbard, Paul J, and Susan F Tierney. *Carbon Control and the Economy: Economic Impacts of RGGI's First Three Years*. The Electricity Journal, 20 Oct. 2011.

Hibbard, Paul J, et al. Analysis Group, 2011, pp. 1–54, *The Economic Impacts of the Regional Greenhouse Gas Initiative on Ten Northeast and Mid-Atlantic States Review of the Use of RGGI Auction Proceeds from the First Three-Year Compliance Period* .

Hibbard, Paul J, et al. Analysis Group, 2018, pp. 1–47, *The Economic Impacts of the Regional Greenhouse Gas Initiative on Nine Northeast and Mid-Atlantic States*.

Navarro, Mireya. "Christie Pulls New Jersey From 10-State Climate Initiative." *The New York Times*, The New York Times, 27 May 2011, www.nytimes.com/2011/05/27/nyregion/christie-pulls-nj-from-greenhouse-gas-coalition.html.

"New Jersey - State Energy Profile Analysis." Energy Information Administration (EIA). U.S. Energy Information Administration - EIA, September 17, 2020. https://www.eia.gov/state/analysis.php?sid=NJ.

NJDEP, Office of Climate and Energy. "Statewide Greenhouse Gas Emission Inventory for 2008 ." *New Jersey Department of Environmental Protection*, May 2011, www.nj.gov/dep/sage/docs/ghg-inventory2008.pdf.

"Official Site of The State of New Jersey." *Regional Greenhouse Gas Initiative (RGGI) - Air Quality, Energy and Sustainability (AQES) | Department of Environmental Protection*, www.state.nj.us/dep/aqes/rggi.html.

"Potential Impacts of New Jersey Rejoining RGGI ." *Mjbradley.com*, M.J. Bradley & Associates, LLC, 19 Jan. 2018, www.mjbradley.com/sites/default/files/MJBA_NJ_Considers_Rejoining_RGGI.pdf.