

Caiazza Comments on Third Program Review April 2023

Introduction

I have been involved in the RGGI program process since it was first proposed. I follow and write about the [details of the RGGI program](#) in my retirement because its implementation affects whether I will be able to continue to be able to afford to live in New York. I have extensive experience with air pollution control theory, implementation, and evaluation of results having worked on every cap-and-trade program affecting electric generating facilities in New York including the Acid Rain Program, Regional Greenhouse Gas Initiative (RGGI) and several nitrogen oxide programs. The opinions expressed in these comments do not reflect the position of any of my previous employers or any other company I have been associated with, these comments are mine alone.

I submitted [initial comment recommendations](#) and followed up with [supplemental comments](#) in October 2021. Those comments addressed my concerns about a “binding” allowance cap, a possible emissions trajectory to zero by 2035 and market monitoring. Since then, the observed emissions and allowances data reinforce my concerns. I recommend that RGGI address these issues during this program review.

My comments address those concerns within the questions raised at the March 29 meeting. There are two relevant questions related to my concerns: How comfortable are you with the assumptions that have been included and are there other assumptions that need to be included in these scenarios?

Fifth Compliance Period Status

In my [initial comments](#) on the Third Program Review my overall recommendation was to make no changes and see how the RGGI allowance market plays out the transition to the unprecedented emissions trading situation in which the majority of the RGGI allowances are held by entities who purchased allowances for investment rather than compliance purposes. I don't think that the assumptions that have been included adequately address these uncertainties.

My latest analysis of allowance holdings and emissions confirms compliance entities will have to obtain allowances from non-compliance entities to meet compliance obligations at the end of 2023. The attached spreadsheet “RGGI Emissions Allowance Status March 31 2023 updated 040923” includes tab “Projections” that describes the current status of the RGGI allowances. The analysis is complicated because the RGGI auction and market monitoring reports lag the emissions and auction adjustments. The other problem is dealing with Pennsylvania and Virginia participation. Because VA is currently in, my analysis assumed that they must meet their 2021-2023 compliance period obligations and that their share of allowances will be auctioned this year. RGGI is dealing with Pennsylvania confusingly. RGGI COATS emissions data includes Pennsylvania emissions for Q3 and 4 2022 but no Pennsylvania allowances have been auctioned. In order to make a projection I assumed that Pennsylvania will have to meet compliance obligations for the second half of 2022 and all of 2023 and that applicable allowances for Pennsylvania sources get auctioned by the end of 2023.

At the end of the fourth quarter of 2022 the [RGGI Market Monitoring Report Q4 2022](#) noted that there were 231 million allowances in circulation. The report noted that approximately 148 million of the

allowances in circulation (64 percent) are believed to be held for compliance purposes. This does not account for 2022 interim 50% allowance surrender

There have been changes to the allowance bank since the fourth quarter report. At the end of March 2023 allowances were added at the March 8, 2023 allowance auction. According the allowance auction report 21.5 million allowances auctioned and 17.6 million , or 82%, were purchased for compliance purposes. In addition allowances were subtracted for 2022 interim compliance. Last year RGGI sources emitted 151.8 million tons including Pennsylvania from 7/1/22. That means there was a 75.9 million ton compliance obligation. I estimate that there were 176.6 million allowances in circulation at end of March 2023 and that approximately 89.8 million allowances (51%) were held for compliance purposes

I estimated the allowance status at end of the 2021-2023 compliance period before the 2023 emissions surrender. The remainder of the 2023 allowance auctions (64.6 million allowances) will be added to the allowance bank. I assumed that Pennsylvania allowances totaling 39 million allowances for Q3 and Q4 2022 and another 75.5 million allowances for 2023. The remaining allowance surrender obligations for the first two years have to be subtracted: 55 million tons for 2021 and 75.9 million tons for 2022. Based on these numbers I assume that there will be 224.9 million estimated allowances in circulation before allowances are surrendered for 2023 emissions with 105.8 million allowances held for compliance purposes.

I assumed that 2023 emissions would be equal to 2022 emissions for all the RGGI states including Pennsylvania for the full year. That equals 193.3 million tons. It also means that **87.5 million allowances must be obtained from non-compliance entities for compliance and that the next compliance period will start with an allowance bank of only 31.6 million.**

There are two unprecedented concerns. In the fifth compliance period the compliance entities are going to have to use allowances now held by non-compliance entities and in the sixth compliance period the allowance cap is going to be binding. I define a binding cap as one chosen arbitrarily without any feasibility evaluation. The environmental community has demanded a binding RGGI cap for years and it looks like they are going to get their wish in the 2024-2026 compliance period. These concerns should be addressed in the “are there other assumptions that need to be included in these scenarios” question posed at the March 29 meeting.

Non-Compliance Entities

Based on the evaluation described above I estimate that compliance entities will be required to obtain allowances for compliance from non-compliance entities. If my presumptions about Pennsylvania participation and the allowance bank are correct and 2023 emissions equal 2022 emissions, I project that compliance entities will need to get at least 45% of the allowances necessary for compliance from non-compliance entities. This is unprecedented and no one knows what will happen. However, it is not unreasonable to expect that the non-compliance entities will demand a premium to purchase their allowances.

There is another non-compliance entity issue. In my [previous comments](#) I pointed out that at least one non-governmental environmental entity has purchased allowances and “will be retiring these

allowances so that no power plant can use them to emit greenhouse gas”. I suggested that this ownership entity should be included as a new category in the Potomac Economics market monitoring reports and that a surrender account be established for individuals and organizations that want to use RGGI allowances for offsetting purposes. Nothing has changed so we are left to hope that the Potomac Economics market monitoring report non-compliance entity category has at least 87.5 million allowances that will be available for compliance purposes.

Observed Emission Reductions to Date

In my [previous comments](#), I showed that fuel switching from coal and residual oil to natural gas has been the primary CO2 reduction methodology to date. Of particular importance to the future program is that the potential for future fuel switching is limited outside of Pennsylvania. The following table lists CO2 emissions for each state by primary fuel type. The retirement of the coal-fired Homer City facility was recently announced and that facility was responsible for 2% of 2022 emissions. If Pennsylvania joins RGGI as a full-fledged member and coal retirements from its facilities occur in the future the current reduction trajectory is feasible. If those conditions do not occur then the only way to produce reductions is by displacement with zero-emissions generating sources. Eventually, investments will be the only method for reducing affected source emissions.

EPA CAMD 2022 Observed CO2 Mass

| CO2 Mass | Coal | Diesel Oil | Natural Gas | Other | Residual Oil | Total |
|------------|------------|------------|-------------|---------|--------------|-------------|
| CT | 0 | 21,103 | 9,632,707 | 0 | 237,656 | 9,891,466 |
| DE | 169,755 | 2,816 | 1,752,825 | 0 | 165,987 | 2,091,383 |
| MD | 5,496,742 | 17,108 | 7,137,878 | 18,142 | 13,753 | 12,683,622 |
| MA | 0 | 13,552 | 7,170,915 | 857 | 145,553 | 7,330,878 |
| ME | 0 | 0 | 1,817,255 | 0 | 218,462 | 2,035,717 |
| NH | 363,457 | 0 | 2,101,312 | 0 | 134,065 | 2,598,834 |
| NY | 0 | 169,558 | 29,341,308 | 508,036 | 419,292 | 30,438,193 |
| RI | 0 | 0 | 3,068,849 | 0 | 0 | 3,068,849 |
| VT | 0 | 3,903 | 0 | 0 | 0 | 3,903 |
| NJ | 736,838 | 6,130 | 14,916,768 | 0 | 0 | 15,659,735 |
| VA | 3,774,034 | 50,266 | 21,316,515 | 0 | 34,295 | 25,175,110 |
| PA | 28,515,180 | 38,418 | 53,295,793 | 0 | 187,458 | 82,036,849 |
| Homer City | 3,833,417 | | | | Total | 193,014,541 |

One of my problems with the RGGI cap and invest program is that while it is supposed to be a pollution control program in which the auction proceeds are invested in emission reduction technology, the proceeds have not provide effective reductions. In my previous comments I noted that the total of the annual reductions claimed by RGGI in their annual [Investments of Proceeds](#) updates since 2009 is 2,818,775 tons while the difference between the baseline of 2006 to 2008 compared to 2019 emissions is 72,908,206 tons. Therefore, the RGGI investments are only directly responsible for less than 5% of the total observed reductions since RGGI began in 2009. (Note that [I did an update](#) for information through 2020 that did not change these findings.)

Binding Cap

Another uncertainty added to the issues raised at the March 29 meeting is the binding cap. I define a binding cap as one chosen arbitrarily to meet some emission reduction target without considering the feasibility of emission reductions necessary to meet that target. The problem that advocates do not understand is that CO2 control is different than other pollutants because there are no cost-effective controls available for existing facilities. Instead, CO2 reductions at electric generating facilities require development of zero-emissions resources to displace the need for electric energy output at affected sources. If the energy from those zero-emissions resources is insufficient to replace affected source generation, then reliability issues will occur if insufficient allowances are available.

The binding cap must be considered in the context of the reason for the observed emission reductions and the impact of inefficient RGGI proceeds for reductions. I recommend that assumptions addressing the binding cap issues need to be included in the RGGI scenarios. The RGGI states all have various CO2 emission reduction mandates that rely on electrification of other sectors. This will necessarily increase load at the same time the deployment of low-emitting generation will be the primary emission reduction methodology. EPA cap and trade programs such as the Cross State Air Pollution Rule established caps based on technological evaluation of control options. The RGGI reduction trajectory was established based more on arbitrary decarbonization timelines than a deployment schedule supported by a feasibility analysis. The modeling for this program review must include modeling analyses that consider the zero-emissions deployment schedules. Sensitivity analyses that consider delays to the deployment of wind and solar resources should also be included.

Conclusion

My comments addressed two of the questions raised at the March 29 meeting.

RGGI asked “how comfortable are you with the assumptions that have been included.” Because future reductions will rely more heavily upon displacement of affected source energy production by wind and solar at the same time emission reductions in other sectors rely on increased electrification, I am particularly concerned about the load forecasts and availability of low-emitting generation assumptions. The impact of future load growth and the schedule for low-emitting generation deployment should be considered in the modeling at least by sensitivity analyses.

RGGI also asked if there are other assumptions that need to be included in these scenarios? The RGGI presentation noted significant uncertainties. I believe that two other uncertainties need to be considered. My analysis of the status of emissions and allowances shows that compliance entities will have to depend on allowances from the non-compliance entities for the fifth compliance period ending this year. That analysis also shows that when the sixth compliance period starts in 2024 there will be an extremely small allowance bank. I believe that these added uncertainties need to be addressed in the modeling for this program review.

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