Tschach Solutions GmbH
Steinhäuserstr. 9 · 76135 Karlsruhe

Tel: +49 (0) 721 205 9629 0
Fax: +49 (0) 721 205 9629 10
Email: info@analytics.icis.com
www.analytics.icis.com

December 5, 2016

Comments to RGGI on Nov. 21 Workshop

ICIS is the world's largest petrochemical market information provider and has fast-growing energy and fertilizer divisions. Our aim is to give companies in global commodities markets a competitive advantage by delivering trusted pricing data, high-value news, analysis and independent consulting, enabling our customers to make better-informed trading and planning decisions. We have more than 30 years' experience in providing pricing information, news, analysis and consulting to buyers, sellers and analysts.

With a global staff of more than 800, ICIS has employees based in Houston, Washington, New York, London, Montpellier, Dusseldorf, Karlsruhe, Milan, Mumbai, Singapore, Guangzhou, Beijing, Shanghai, Yantai, Tokyo and Perth. ICIS is a division of Reed Business Information, part of RELX Group.

At ICIS our analysts blend deep market expertise with behavior-driven analysis of the California, Quebec and RGGI schemes, including other global carbon markets, identifying the policy and regulatory risks early to understand their potential impact on the market and report on this. We're trusted by our clients to analyze why the markets move, what drives that movement and what to expect in the future. It's why we're the go-to source for the North American and other global carbon markets.

ICIS, is grateful for the opportunity to comment on the proposed changes to the program outlined during the November 21 meeting. ICIS firmly believes the changes taken during this program review can have a profound impact on future auctions and the secondary market. As an independent analytic firm, ICIS does have some concerns about the potential impacts outlined by officials earlier this month. We believe that if RGGI does not take proactive steps to address short, mid and long-term issues, the programs objectives would be diminished. With trading returning to the auction reserve price.

Sincerely,

North American Carbon Analyst Team at ICIS

Tschach Solutions GmbH
Steinhäuserstr. 9 · 76135 Karlsruhe

Tel: +49 (0) 721 205 9629 0
Fax: +49 (0) 721 205 9629 10
Email: info@analytics.icis.com
www.analytics.icis.com

Emissions Forecasting

Emissions forecasting is subject to a variety of risks and long-term emissions forecast is likely to be wrong or underestimated due to unforeseen technological advancements. We believe that for RGGI, in particular, there is a risk that emissions will be lower in the future than they are currently forecasted.

Risks to an Emissions Forecast

Those risks are tied to nuclear generation, renewable generation and political shifts that will transform US energy policy.

Nuclear generation

- Retirement of Indian Point Energy Center in 2019 seems unlikely given the long lead time to a nuclear power plant retirement.
- A later retirement could be seen as a base case assumption rather than a low emissions case.

Renewable generation is likely underestimated

- State renewable energy goals used in the modeling are lower than the ones published by states. For example, New York's Clean Energy Standard has set its renewable target at 75TWh in 2030. That figure is significantly higher than the 61TWh modeled.
- It is likely that states will set up supporting schemes to reach their renewable targets. As a result, those targets should be part of the modeling.

Political shifts

- The Clean Power Plan (CPP) will likely face increased challenges with president-elect Donald Trump taking office next year
- With the suspension of the CPP (and potential dismantle), RGGI is less likely to see new states looking to enter the program
- No additional states joining RGGI could increase leakage and further reduce forecasted emissions

We believe that all of these factors will likely decrease emissions further, yielding few foreseeable reasons why carbon-intensive sources would increase over the next decade. As a result, there is a higher risk of emissions being lower than expected rather than the other way around.

Therefore, we suggest that the program be set up in a way that it incentivizes additional emissions reductions for any emissions scenario. Those incentives could either come from high prices early in the revised program or the expectations of shortages and higher prices in the future.

Under the current RGGI design, the market is likely to see its bank of allowances grow in the post-2020 period, when cap adjustments no longer stop a portion of the annual budget from entering the market. The 2.5% annual cap reduction factor is also unlikely to keep pace with emission reductions already occurring in the power sector.

Tschach Solutions GmbH
Steinhäuserstr. 9 · 76135 Karlsruhe

Tel: +49 (0) 721 205 9629 0
Fax: +49 (0) 721 205 9629 10
Email: info@analytics.icis.com
www.analytics.icis.com

Emissions controlling reserve (ECR)

We believe that if set up correctly, the ECR could provide supply flexibility that would reduce supply in times of low demand and would be the first mechanism to account for an oversupply in the market. However, the ECR needs to follow several criteria to ensure it provides that benefit to the market.

Trigger Price

The trigger price would need to be set up to incentivize emissions reductions at prices below the trigger price.

- Companies should theoretically choose between reducing emissions through investments and buying ECR volumes at auction (buying available auction volume above the ECR price but below the cost-containment reserve price- CCR). If prices are set too low, RGGI would remove a potential incentive to reduce emissions, making higher emissions reductions unlikely.
    - ECR volume could also be purchased as a result of regular market activity rather than actual fundamental need, especially if the floor price and ECR trigger price are close together.
- A more stringent cap or emissions target could not be achieved unless the ECR is triggered – thereby removing volume from the market -- every single year.
    - A low-emissions outcome should not be seen as an unlikely scenario given the concerns raised in the previous section. Because of that, the ECR should specifically account for and target this potential outcome.
    - Trading and emissions reduction incentives should still remain even if emissions are already low.
    - A high ECR trigger price would also act as a mechanism to reduce banked volumes after 2020.
    - RGGI would also need to have sufficient gaps between the auction reserve price, the ECR trigger price and the cost-containment reserve (CCR) price. If prices are too close among these three tiers, it could create range bound prices in the future.
    - This outcome could also mute secondary market activity, because there would not be sufficient space to trade inside of those tiers.

Different Trigger for the ECR

Rather than a price trigger, we believe that the ECR could be triggered based on annual or compliance period fundamental data.

- This would mean that following a year where emissions are significantly (i.e. a certain % set by RGGI) lower than the cap the ECR would be triggered and volumes would be removed from the annual budget.
- By using this format, RGGI could ensure ECR volumes are removed from the market if emissions are lower than expected.
- A fundamental balance trigger could be a better trigger than auction clearing prices, which are not always an accurate portrait of the market.
    - For example, 2016 auction prices have been slowly decreasing, but the market has been getting less oversupplied every quarter.
    - It would also allow the ECR to operate independent of price shocks coming from policy developments, (i.e. February 2016 – price decline following the stay of the CPP).
    - With a price trigger, market participants could try to keep the auction price above the ECR trigger to ensure that volume is not taken out of the market.

Tschach Solutions GmbH
Steinhäuserstr. 9 · 76135 Karlsruhe

Tel: +49 (0) 721 205 9629 0
Fax: +49 (0) 721 205 9629 10
Email: info@analytics.icis.com
www.analytics.icis.com

ECR Volumes

We suggest that RGGI outlines what will happen with the volumes removed by the ECR

- Potential options include: retire them, making them available again in later years in addition to the CCR
- If retired, it would strengthen the impact of the ECR as it would more strongly enforce the more stringent cap.
    - However, it could also be a reason for market participants to avoid having the ECR volumes taken out of the market permanently.

Fundamental Modeling by ICIS

According to our internal modeling, the ECR could fundamentally change the market because the more stringent caps discussed by RGGI appear reachable. Our model assumes slightly lower emissions in RGGI throughout 2030, and as a result, 2.5% and 3.5% annual reductions would not result in cumulative short positions by 2030.

To emphasize the necessity of a stringent ECR, ICIS analysts modeled three scenarios. In each scenario, we worked with our emissions forecast, which – based on the points aforementioned in this document- assumes lower emissions throughout the program. In each scenario, the ECR was calculated based on the cumulative difference between the base cap and more stringent cap over the 2021-2030 period and then split evenly over that 10-year period.

The scenarios are defined as follows:

- Scenario 1: Base cap: 2.5%, stringent cap 3.5%
- Scenario 2: Base cap: 3.5%, stringent cap 5.0%
- Scenario 3: Base cap: 3.5%, stringent cap 6.5%

In Figure 1, the lines show the cumulative fundamental balance of the market while the bars show the annual balance with the ECR volume removed from auctions. The modeling below compares ICIS emissions to the RGGI cap minus the ECR volume, so it assumes that the ECR is fully triggered every year post-2020.

This analysis indicates the following:

In Scenario 1, the more stringent cap defined by the ECR is not set ambitious enough, leaving the market oversupplied even without all ECR volumes post-2020. In our opinion, RGGI should either try to avoid this scenario by setting a more stringent cap for the ECR or setting the price floor or the ECR trigger price high enough to still trade at prices that incentivize emission reductions even with an oversupply in the market.

Scenario 2, with the ECR cap set at a 5% annual reduction, the market would turn cumulative fundamentally short by 2029 if the ECR was fully triggered every year. In our view, it shows how the ECR could contribute to making the program more ambitious, if the trigger is set right and it takes out volumes out of the market regularly.

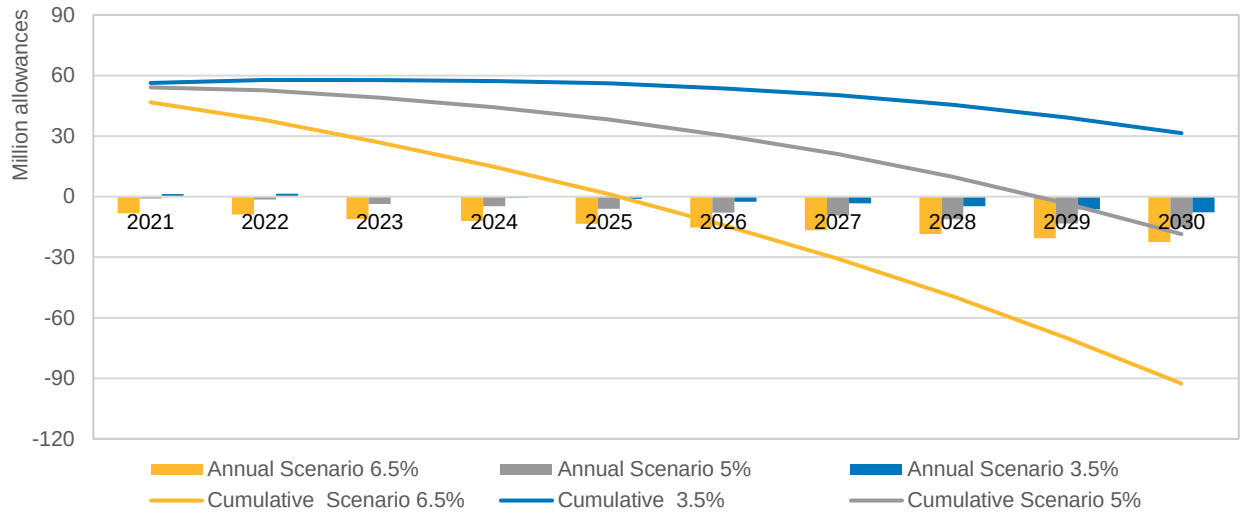
In Scenario 3, with a particularly ambitious cap reduction of 6.5% annually, the market turns fundamentally short in cumulative terms beginning in 2025, if the ECR is triggered and the volumes taken out every year. In this setting it is more likely that the ECR is not triggered fully every year, because the market will fundamentally need those volumes to be balanced towards 2030. This outcome assumes that unsold ECR volume would not be available in future years. With the trigger price set right, Scenario 3 could, in our opinion, provide long term incentives for abatement. The availability of ECR volumes if prices are above the trigger price, however, could prevent sudden high prices in the later years.

By having a more stringent emissions goal for example via the ECR, RGGI could minimize the need for a bank adjustment in the post-2020 program, because those aggressive goals would force the bank to be depleted by 2030.

Tschach Solutions GmbH
Steinhäuserstr. 9 · 76135 Karlsruhe

Tel: +49 (0) 721 205 9629 0
Fax: +49 (0) 721 205 9629 10
Email: info@analytics.icis.com
www.analytics.icis.com

Figure 1: Fundamental Balance of Modeled ECR Scenarios



Source: RGGI/ ICIS

Behavior of Market Participants

The assumption of perfect foresight and its impact on emissions is a strong assumption. In our view, market participant's behavior is generally more short-term oriented and varies significantly on an individual basis in the market.

- Generally, it is unlikely that an expected exhausting of the bank in 2031 will increase prices in the next few years. Especially since this suggests the market will remain oversupplied for another 15 years.
- From our perspective, market participants generally plan on a timeframe that is a maximum of three years. For smaller compliance entities, the span could be even shorter.
- There are also two kinds of market participant purchasing behavior:
    - Fundamental behavior – How much fuel is burned? How many tons CO2 are emitted?
    - To influence this behavior in the longer term, allowances prices would have to be high enough to incentivize long-term investment decisions
    - This behavior decides how much is emitted
- Traded behavior – How many allowances are bought at a specific time?
    - This behavior is more short-term oriented and is influenced by a number of factors, (i.e. speculative positions, mid-term outlook of the market or need to buy allowances at a certain point in time).
    - This behavior impacts the price outside of the fundamental needs
- For some companies, fundamental behavior and traded behavior are similar. For others, they are very different.
    - For example, a smaller power producer might run its power plant independent of the carbon costs and afterwards buy the allowances to cover his emissions independent of the price
    - Larger producers might optimize their power production based on current and expected future carbon costs. In this case, their current demand for allowances might differ significantly from their historic emissions, in particular if they would expected prices to rise in the future.
- Ideally, we believe RGGI would be able to influence the behavior of market participants that drives long-term emissions reductions.

Tschach Solutions GmbH
Steinhäuserstr. 9 · 76135 Karlsruhe

Tel: +49 (0) 721 205 9629 0
Fax: +49 (0) 721 205 9629 10
Email: info@analytics.icis.com
www.analytics.icis.com

- We generally expect that the long-term view of market participants strongly influence their mid-term behavior. In case of low ambition post-2020, the incentives to participate in the market could be reduced.
  - Accounting for the current oversupply in the market, this could result in prices back to the floor price in the mid-term.
  - This would also result in lower revenue for the RGGI states and even less incentive for compliance companies to reduce their emissions.
  - RGGI could also lose its integrity if it was trading at the floor price for a number of years in the future.
- To ensure an active and functioning market in the following years, we suggest changes to the program provide price support in the mid-term.

In the past, RGGI has shown the willingness and ambition to improve its program regularly. In 2012, the review ensured that prices increased above the floor price again and trading activity increased. While the review process shows RGGI's ambition to have a working program, it also increases uncertainty in the market.

- The 2016 review process and the resulting uncertainty has decreased activity in the market throughout the year and is likely to continue to do so until an agreement is reached.
- We believe that one goal of a cap-and-trade program should be to incentivize long-term investments into lower/no emission technologies. This is only possible, if there is a good predictability of the outlook of the market.
- A program that changes it system fully every three years does not provide this type of certainty.