

Perspectives on the PJM Carbon Pricing Senior Task Force

May 19, 2020

An integrated, competitive supplier and retailer:

- Own approximately 40,000 MW in 6 of 7 RTO markets nationwide,
 - 10,000 MW in PJM
 - Mostly conventional generation – used to be ~ 70% coal as recent as 2016, now is 2/3 gas.
 - 180 MW solar facility in Texas with the largest battery storage facility in Texas – 10 MW/42 MWh.
 - Currently developing a 300 MW/1200 MWh battery in California, expected to be online Q4 2020.
- Have ~ 5 million retail customers in 20 states nationwide – the largest competitive residential electric supplier nationwide.

Greenhouse Gas Reduction Goals



Vistra has announced a goal to reduce CO₂ equivalent emissions by more than 50% by 2030, and by 80 – 100% by 2050, as compared to a 2010 baseline.

- To achieve these goals, we need supportive market policy.
 - We think carbon pricing is the answer. Specifically, we support a national, economy-wide price on carbon and paying a dividend to help alleviate the rise in energy costs.
 - Consistent with that, we are a founding member of the Climate Leadership Council, which is a bipartisan group of Nobel Laureate economists, businesses, and environmental groups actively advocating Congress to this end.
 - The benefits are numerous – most efficient method, allows economic tradeoffs between sectors, gives all emitters an incentive to reduce emissions, harnesses the power of competition, and incentivizes as yet unknown solutions to emerge.
 - We have also filed comments supportive of Pennsylvania joining RGGI.

We want carbon pricing to be a real option for states that want to use state policy to transition toward cleaner generation resources.

- We know there are numerous state policies within the PJM region than lean toward cleaner energy. The FERC MOPR order recently found most of these to constitute out-of-market state subsidies, and a need to mitigate these in the capacity market.
- We want states to have a in-market clean energy policy option that would not be penalized.

To that end, we are open-minded on subregional border adjustments or other market changes to empower state carbon pricing choices in the regional market context.

- Thus far, we think the modelling is inconclusive on any preferred border adjustment method, and highlights that the problem to solve looks different depending on the RGGI state configuration. For example:
 - With the MD, DE, & NJ footprint,
 - Carbon pricing alone increases net RTO emissions
 - Border adjustments **decrease** net RTO emissions.
 - With the expanded MD, DE, NJ, VA, & PA footprint,
 - Carbon pricing alone decreases net RTO emissions
 - Border adjustments **increase** net RTO emissions.

The studies show that carbon pricing alone, without border adjustments, works better as the carbon-pricing footprint gets bigger.



Results Executive Summary

Results depend on the generation mix, and emissions intensities, of each sub-region.

Modeling of Carbon Prices from RGGI

Compared to counterfactual with no carbon price

- Generation & Emissions
 - **Decrease** in carbon-price sub-region
 - **Increase** in rest of RTO
 - Net RTO impact varies based on sub-region assumptions
- Energy Prices
 - On average, LMPs **increase** in both sub-regions as the carbon price increases

Impacts of Border Adjustments

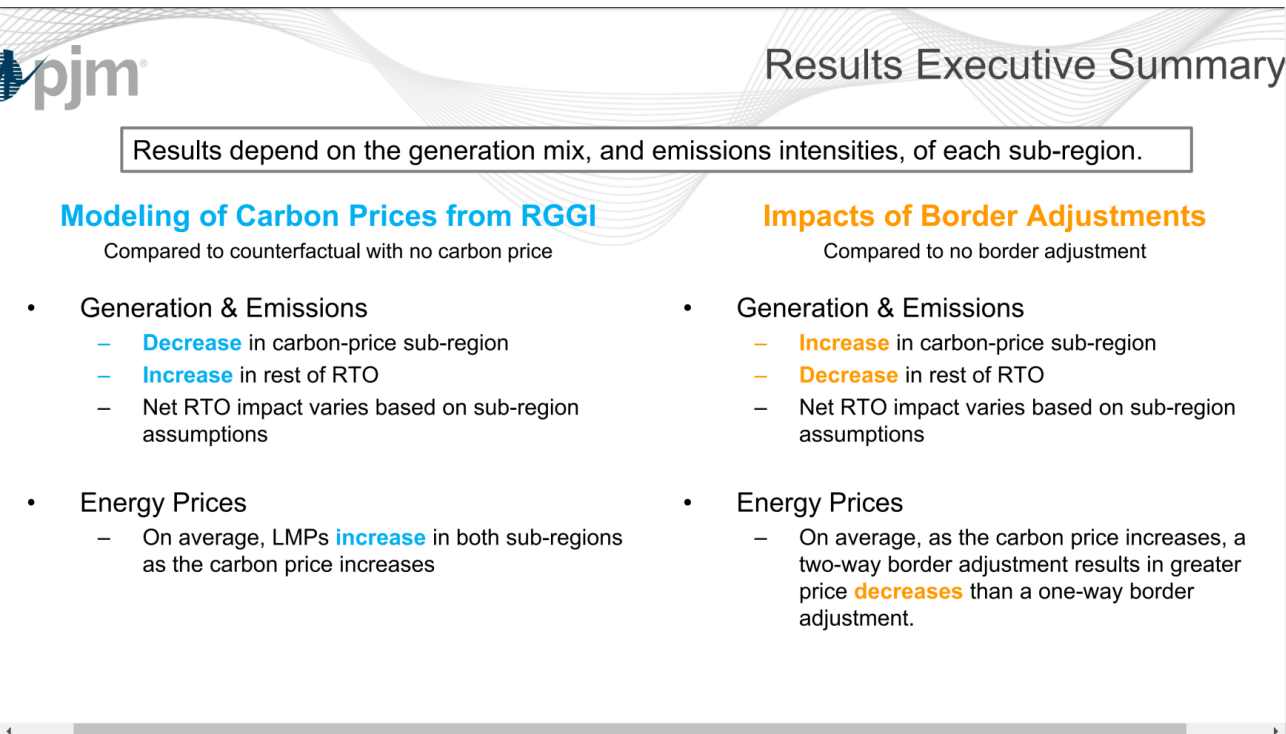
Compared to no border adjustment

- Generation & Emissions
 - **Increase** in carbon-price sub-region
 - **Decrease** in rest of RTO
 - Net RTO impact varies based on sub-region assumptions
- Energy Prices
 - On average, as the carbon price increases, a two-way border adjustment results in greater price **decreases** than a one-way border adjustment.

Border adjustments work in the opposite direction of carbon pricing alone.

Standard for Evaluating Border Adjustments

How to evaluate the efficacy of border adjustments:
Compare to carbon pricing across the footprint



Results Executive Summary

Results depend on the generation mix, and emissions intensities, of each sub-region.

Modeling of Carbon Prices from RGGI Compared to counterfactual with no carbon price	Impacts of Border Adjustments Compared to no border adjustment
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Expected Impacts of RTO-wide Carbon Pricing

- Generation & Emissions
 - Generation relatively **steady**
 - **Decrease** in emissions
- Energy Prices
 - LMPs **increase**, at least in the short term.

- Regional carbon pricing would decouple the relationship between generation and emissions
 - Carbon pricing should reduce emissions while still serving load.
 - Adjustments at the RTO border can avoid disadvantaging exports and put imports on a level playing field.
- Carbon pricing would increase LMPs, at least in the short term, and that's not a bad thing.
 - All state clean energy policies cost money – the question is whether you're getting the most bang for the buck.
 - Competitive markets have a history of delivering value. Increased LMPs from carbon pricing would:
 - build a clean premium into market prices, as opposed to out-of-market payments
 - making renewables more competitive
 - incentivize existing resources to decrease emissions on the margin
 - incentivize new solutions to emerge and enter the market
 - Notably, the clean premium would be targeted toward energy production at times of higher emissions
 - The money that emitting resources spend on carbon allowances goes into a fund for the state to decide how to spend or return to customers.

Subregional Border Adjustments Aren't a Simple Fix



- The border adjustments that have been discussed rely on associating certain generating resources with load either in the carbon pricing subregion or non-carbon pricing subregion.
- Assuming no transmission constraints, border adjustments result in carbon-free generation outside of the RGGI subregion being associated with any import need into the RGGI subregion, as it minimizes production cost to “associate” generation resources that do not require a carbon adder to serve the RGGI subregion.
 - However, it is unintuitive why it is “giving effect to” RGGI state carbon pricing policies by simply accounting for their imported power needs from, say, Illinois’s or Ohio’s nuclear plants, especially when both Illinois and Ohio have separate programs for their own states to claim the zero-carbon attributes associated with those facilities.

Because border adjustments are demonstrably not a simple fix, it is worthwhile to examine carbon pricing across the entire PJM footprint.

It is Vistra's view that PJM should provide leadership on carbon pricing. At the very least, we think PJM is uniquely qualified to facilitate the conversation on carbon pricing across the PJM footprint, by providing needed information to policymakers about likely market impacts.

- In addition to the emissions and cost impacts that PJM has been highlighting in its studies, the PJM-wide carbon pricing study could shed light on whether there is a mutually agreeable solution to be struck between states that do and do not want to pursue carbon pricing? The analysis could address questions like:
 - What is the economic value (based on the carbon price studied) of incremental carbon emission reductions in non-RGGI states?
 - Is there other quantifiable value from a region-wide implementation?
 - How does that incremental value compare to any increased costs in non-RGGI states?

Connection to Other Conversations



Vistra was one of the Interested Parties that recently petitioned FERC to hold a technical conference on regional carbon pricing.

We hope that PJM will participate and present its viewpoint on these issues.

PJM leadership and stakeholders have been talking about teeing up the next conversation on getting past the current MOPR situation and getting to a robust and sustainable market design.

It is our view that if we don't find a way to incorporate state policies into competitive markets, we will never get to that sustainable market design.