

The Carbon Bridge Compact

Vistra Presentation to PJM's Resource Adequacy Senior Task Force

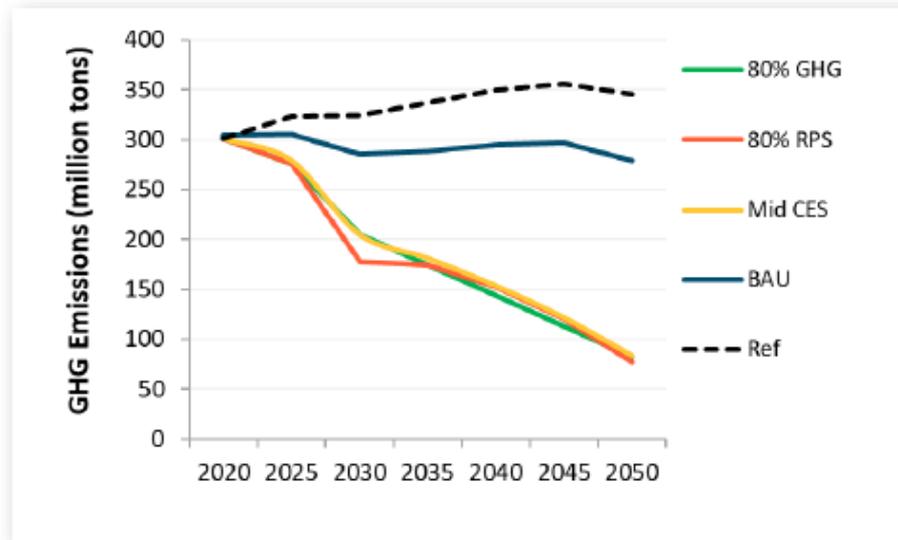
January 10, 2022

- We think the goal is to reduce greenhouse gas emissions.
- Carbon emissions are most directly accounted for in the energy market because emissions are a result of burning fuel and producing energy.
 - In contrast, emissions do not result from resources just being available to produce energy, e.g., by providing capacity.
- Similarly, measuring a new resource's emissions impact depends on the MWh of energy it will produce as well as what it will displace.
- Jointly optimizing the “clean” and “energy” elements of “clean energy” will enhance long-term infrastructure decisions.
 - Bundling the energy and environmental attributes of zero emitting resources will send clear economic signals that can facilitate efficient transmission planning and cost allocation.
 - Recognizing the carbon advantage of lower emitting fossil resources will send efficient retirement decisions.
- We think a carbon price in the energy market is both the most efficient tool and the tool most likely to achieve meaningful emission reductions.
- As the Carbon Pricing Senior Task Force has explored, though, carbon pricing does not necessarily reduce system emissions in a regional market without a system-wide carbon price.

The Benefits of a System-Wide Approach

- Data shows that we cannot achieve ambitious carbon reductions through a patchwork of state-by-state policies. While state decisions control activity within its borders, PJM extends beyond any one state's border.

Figure 15. Cross Comparison of Annual GHG Emissions

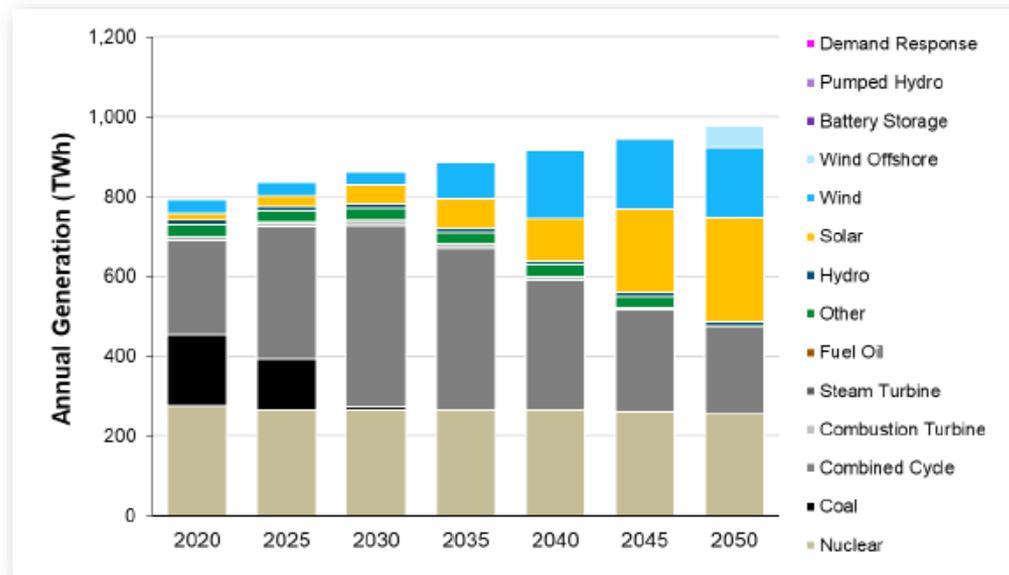


- Source: E3, Least Cost Carbon Reduction Policies in PJM (BAU = current patchwork of policies, 80% GHG is a carbon price needed to achieve 80% reduction by 2050), available at <https://www.ethree.com/wp-content/uploads/2020/10/E3-Least-Cost-Carbon-Reduction-Policies-in-PJM-1.pdf>

An Orderly Trajectory to Decarbonization

- An efficient course to decarbonization would not only build more nonemitting resources, but also signal value in running relatively lesser emitting resources. Carbon pricing provides a signal that applies to both.

Figure 10. Annual Generation for the 80% GHG Case across All Modeled Years



- Source: E3, Least Cost Carbon Reduction Policies in PJM (80% GHG is a carbon price needed to achieve 80% reduction by 2050).

- We have worked with PA Consulting to model and analyze the impacts of regional carbon pricing, and to create a framework that would facilitate regional carbon pricing in PJM.
- In recognition of the different states in PJM, we have constructed what we call the Carbon Bridge Compact.
 - We examine whether implementing fully regional carbon pricing could pay for itself through generating additional sources of revenue, and savings within existing state clean energy programs, to offset the increase in energy costs to customers in non-RGGI states.

Carbon Reduction Fund Revenue Streams



Carbon Shadow Pricing

The Carbon Shadow Price paid by generators in non-RGGI PJM states as well as by non-RGGI state imports into PJM

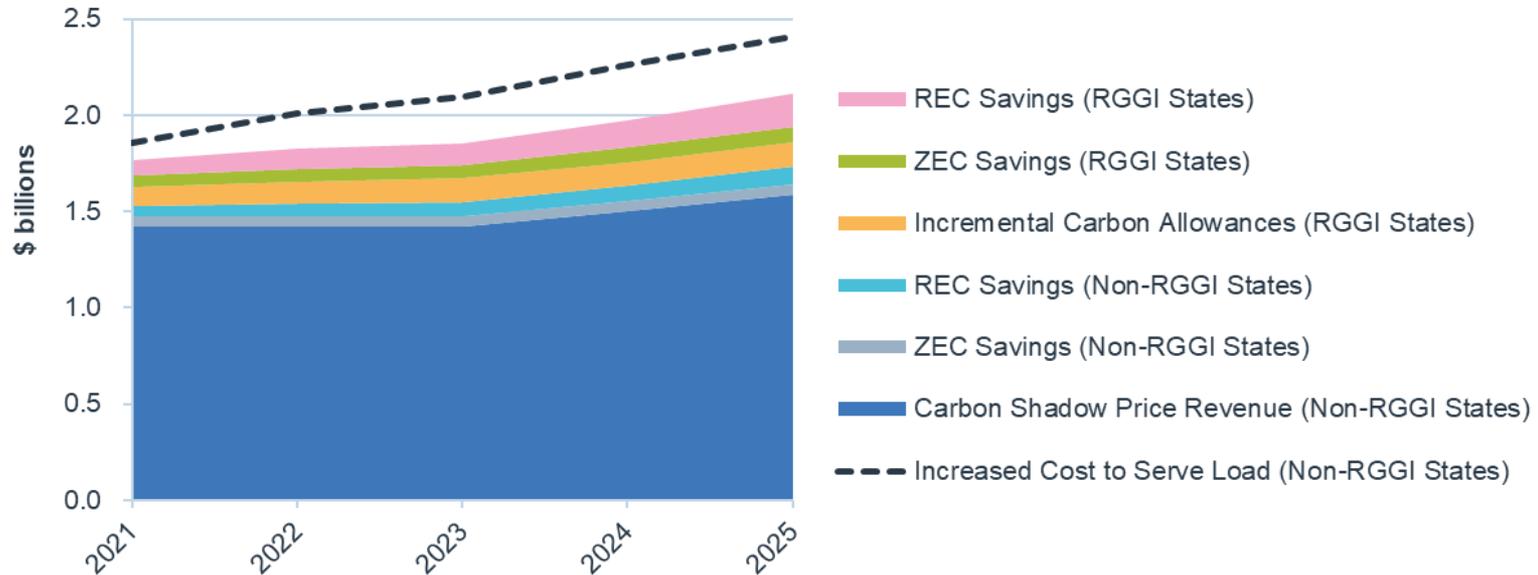
REC & ZEC Savings

Savings from existing state-level policy-driven clean energy payment programs in both RGGI and non-RGGI states

Incremental RGGI Allowances

Incremental RGGI allowances earned in RGGI states (i.e., revenue in excess of status quo)

Carbon Reduction Funds Cover 90% of Non-RGGI State Customer Costs



Benefits to Non-RGGI States

The Carbon Bridge Compact acknowledges that individual states' policies impact costs to ratepayers across state lines and attempts to quantify those costs. Carbon Reduction Funds could be used to offset costs to customers or invest in affected communities.

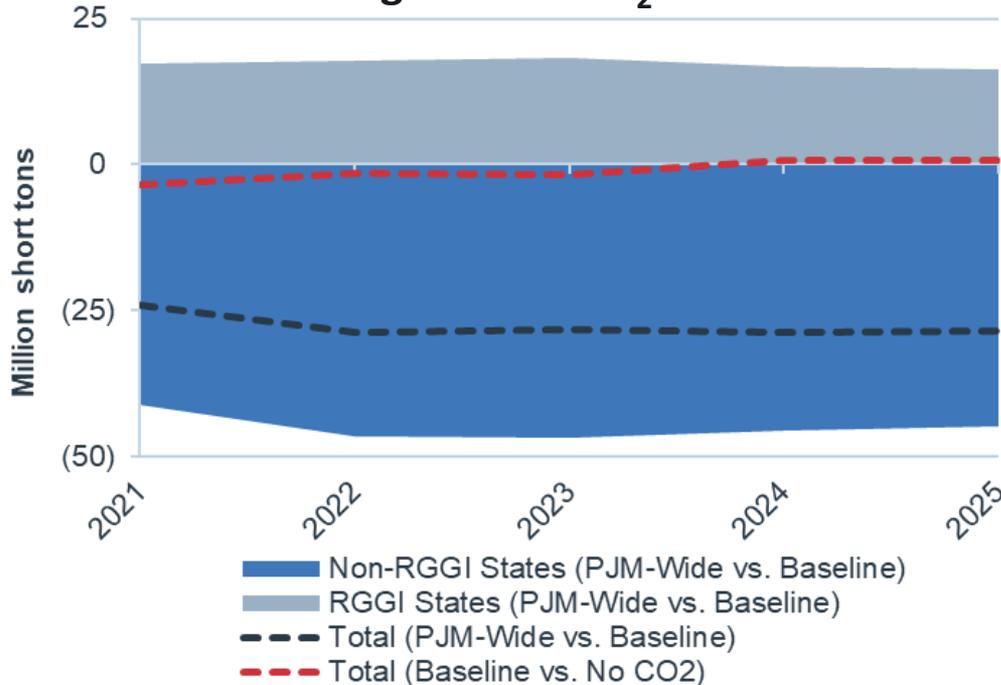
Benefits to RGGI States

The Carbon Bridge Compact also offers states with ambitious climate agendas the opportunity to leverage a wider sphere of influence and achieve more emissions reductions than is possible within their own state boundaries.

Regional Carbon Pricing Yields Meaningful Emissions Reductions



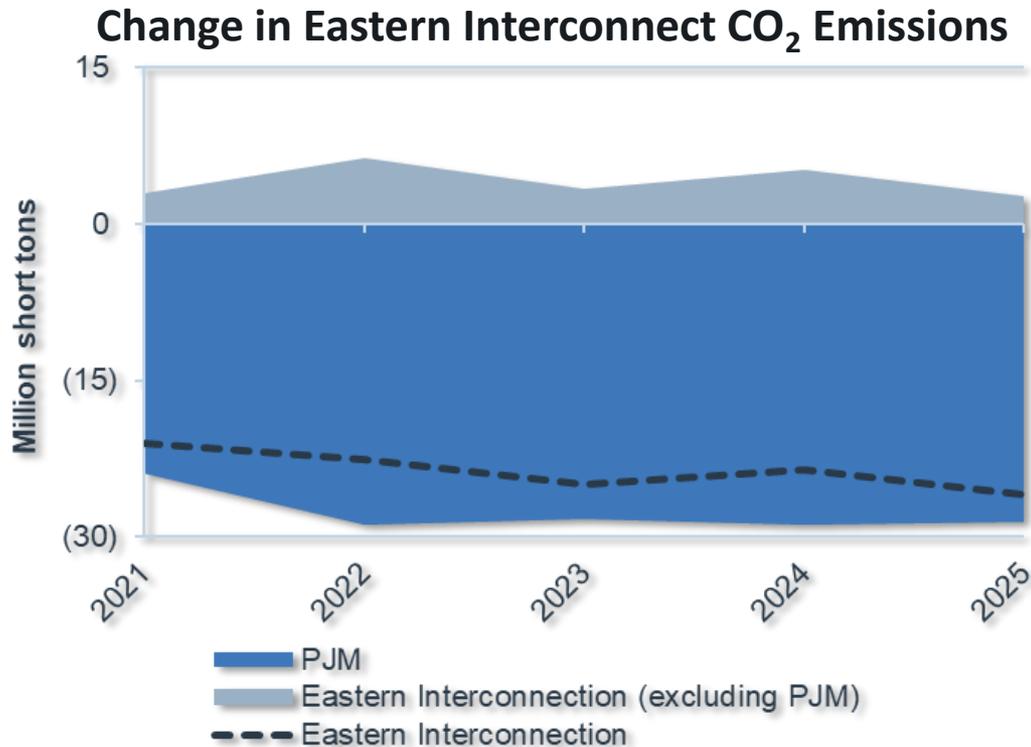
Change in PJM CO₂ Emissions



- A PJM-wide carbon price will yield a meaningful 9% reduction in CO₂ emissions, unlocking the potential of carbon pricing as a tool to reduce system-wide emissions, which has not been realized to date because of the piecemeal state adoption of the Regional Greenhouse Gas Initiative among the PJM states.
- The model likely understates emissions reductions because the implementation of this framework would stimulate more investment in cleaner resources than under a status quo resource mix.

Note. The resource supply (MW) mix is static in the model and does not change in response to the policy.

PJM's Emissions Reductions are Real, and Not a Consequence of Generation Shifting



- Controlling emissions leakage can be more effective at the border of PJM with neighboring balancing areas than across state lines within PJM's single wholesale market optimization.
- PJM would need to examine and implement best practices for external transactions to avoid shifting generation and emissions to surrounding balancing authorities.

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- To implement this framework, PJM states would need to come to agreement on the framework and agree among themselves how to share the Carbon Reduction Funds.
 - PJM will be an authoritative source of information, including potential calculations of what customer costs would have been absent the Carbon Bridge Compact.

Contact Information



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