

October 11, 2019

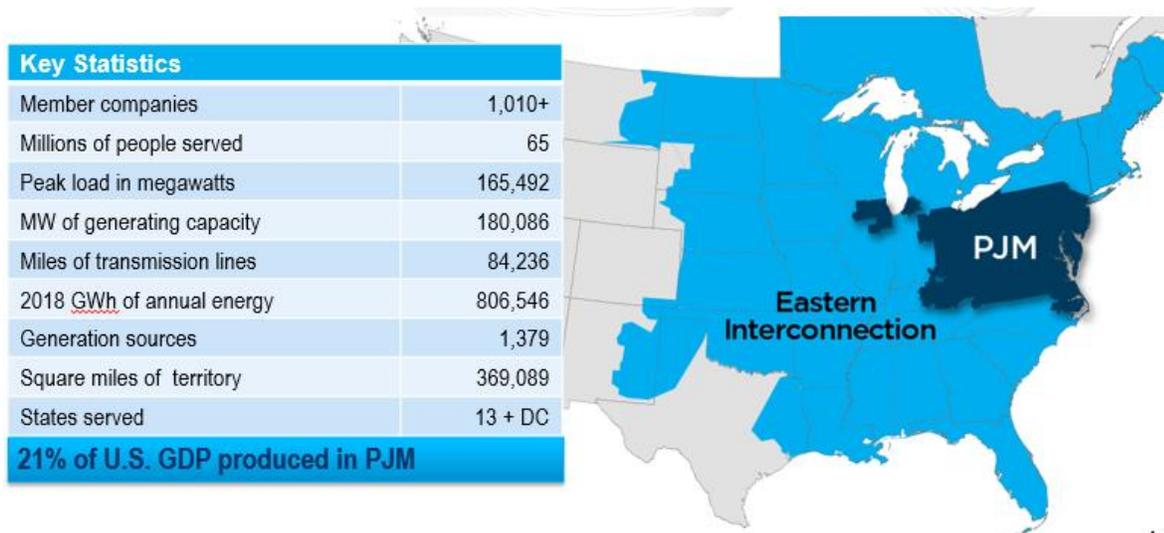
Committee on Energy and Commerce
c/o CleanFuture@Mail.House.Gov
U.S. House of Representatives
2125 Rayburn House Office Building
Washington, D.C. 20515

Dear Committee Members:

PJM Interconnection, L.L.C. (“PJM”) is pleased to provide these responses to the Committee’s inquiry re: greenhouse gas (‘GHG’) regulation. PJM is the FERC-regulated independent RTO responsible for ensuring the reliable operation of the bulk power electric system serving over 65 million Americans in all or parts of 13 states plus the District of Columbia. As part of its core function, PJM:

- coordinates and directs the operation of the region’s transmission grid, which includes over 84,236 miles of transmission lines;
- administers the world’s largest competitive wholesale electricity market; and
- plans regional transmission expansion improvements to maintain grid reliability and relieve congestion.

In addition, PJM Environmental Information Services (“PJM EIS”) provides to states a service, at their request, which tracks the generation output of individual power plants. This tracking service is then utilized to ensure compliance by load serving entities with state renewable portfolio standards (“RPS”). Below is a map of the PJM region and some key statistics attesting to the size of the region served by PJM.¹



As of 1/2019

¹ More information on PJM can be found at www.pjm.com. More information on PJM Environmental Information Services can be found at <https://www.pjm-eis.com/>

Consistent with our past work with the Committee, PJM underscores its commitment to serve as an independent, neutral, fact-based source of information as the Committee deliberates on the question of whether to regulate the emissions of greenhouse gases (“GHGs”) at the national level. PJM appreciates the Committee’s outreach to the nation’s Regional Transmission Organizations (‘RTOs’) and Independent System Operators (“ISOs”) as each RTO and ISO works to ensure reliable and cost effective supplies of electricity to over two-thirds of the nation. PJM provides responses to the Committee’s questions below:

1. What are the key policy, regulatory, and market considerations that should inform the development of comprehensive climate legislation? Please provide specifics.

PJM Response—PJM does not take a position on the substantive issue of whether the Congress should direct the regulation of greenhouse gases. However, given that the electricity generation sector is one of the largest emitters of greenhouse gases in the U.S.,² and given PJM’s role as both the market administrator and entity charged with ensuring reliability in the very large PJM footprint, PJM has a keen interest in the details of how any GHG regulation program is defined. Given PJM’s mission to ensure reliability of electric supplies and its proven use of competitive markets to ensure the reliable supply of electricity efficiently and at least cost to customers, PJM provides the suggestions below so that any such legislation can build on the RTO-administered, market-based systems existing in two-thirds of the nation today that have provided tangible benefits to electricity consumers.³

RTO markets today incorporate public policy as inputs into the price formation process. In essence, environmental policies affect the going forward costs of individual generating units. Those costs are then reflected in the bids those units submit into the RTO energy market. The RTO ‘clears’ the market based on stacking all of the bids, with lower cost resources clearing to serve customers over the next hour or next day while higher cost resources do not clear. Thus, to the extent that a generating unit incurs environmental compliance costs to meet today’s environmental requirements, that unit faces the prospect of being displaced by another ‘cleaner’ unit that does not incur those costs. As a result, PJM’s market design reinforces the goal of environmental compliance at the least cost to the end use consumer. Moreover, the market has allowed customer-driven demand response and energy efficiency to monetize the value of these customer-driven resources and have their value reflected as an alternative to the dispatch of fossil generation.

It is these market fundamentals which led to the efficient and cost effective changeover of much of the generation fleet in the PJM region as a result of implementation of EPA’s Mercury and Air Toxics Standards (“MATS”) rule. The organized markets ensured that incorporation of the MATS requirements was undertaken both efficiently and cost-effectively without impacting overall system reliability.

If the Congress decides to regulate GHG emissions on a national level, today’s wholesale electricity markets are well situated to implement regulation of greenhouse gas (“GHG”) emissions from the electricity sector. By establishing a mechanism to price carbon, Congress

² PJM notes, as did other commenters (that the transportation sector presently exceeds the electricity sector in overall emissions. See Rhodium Group Report: Final US Emissions Estimates for 2018, May 30 2019 <https://rhg.com/research/final-us-emissions-estimates-for-2018/>

³ PJM has detailed the value of organized markets to the 65 million consumers in its footprint. The PJM Value Proposition can be found at <https://pjm.com/about-pjm/~media/about-pjm/pjm-value-proposition.ashx>.

would, in effect, be assigning an environmental compliance cost on carbon-intensive resources. In turn, by design the markets would work to internalize that cost as individual generating units would incorporate that cost into their bids. Comparable ‘cleaner’ resources, which either do not get assessed a cost for their carbon emissions, or are assessed a lesser cost, would clear in the bid stack before the more carbon-intensive resources leading to a least-cost means of incorporating the costs of any Congressional carbon regulatory program into the prices paid by electricity consumers.

In fact, this internalization of carbon costs is already occurring for PJM generators subject to the Regional Greenhouse Gas Initiative (RGGI). Regulating carbon on a sub-regional or individual state basis and incorporating those results into the larger PJM dispatch is occurring today and is certainly manageable today and in the future. But there remain notable differences in each state’s regulatory requirements which pose additional challenges when implemented over a single multi-state dispatch such as those utilized by PJM and the nation’s RTOs and ISOs. *If* the Congress, were to decide, as a policy matter, that regulation of GHGs is in the national interest, the specifics of such a market-based approach, along with PJM’s thoughts on what would be helpful elements of any GHG legislation, are outlined below.

2. Please describe any innovative concepts for climate policy design, including both sector-specific and economy wide measures that you believe the Committee should consider.

PJM Response—As to climate policy design, should the Congress decide to regulate GHG emissions, PJM believes a national, economy-wide program that values carbon is preferable to subnational, sector-specific approaches. A holistic approach eliminates disproportionate impacts on any one region or sector. Additionally, an economy-wide focus would reduce the need for more sector or fuel-specific ‘command and control’ policies, which may not work well with power markets, and in fact could hamper efforts to achieve policy goals reliably and at least cost.

As noted above, a national price on carbon could be readily incorporated into the organized power markets immediately, and would be the most efficient manner by which to reduce GHG emissions across the country. In crafting any such legislation PJM urges Committee consideration of the following issues:

- Addressing potential leakage issues;
- Ensuring appropriate regulatory authority;
- Providing RTOs/ISOs with the tools to ensure bulk power reliability; and
- Harmonizing potentially conflicting policies re: transmission planning and cost allocation.

PJM addresses each of these issues below:

Leakage—Implementing a consistent nationwide carbon price setting mechanism would significantly address today’s ‘leakage’ issue. ‘Leakage’ refers to the fact that as a result of different levels of regulation of carbon among the states vs. the fact that there is a single integrated dispatch of generation at the wholesale level among those states, resources not subject to state or regional carbon regulation have the ability to displace cleaner resources in the states seeking to control carbon. This occurs because the single bid based dispatch would first clear the out-of-region more inexpensive resources to serve the larger RTO footprint including

those states that otherwise were seeking to regulate carbon at the state or sub-regional level.⁴ As carbon prices rise, leakage becomes a more significant issue.⁵ Although leakage would be addressed if the program and prices were uniform across the nation, any state-by-state or individual deviations permitted from the national requirements would carry with it the need for the legislation to empower system operators and regulators to address leakage. Moreover, as Congress debates national legislation, consideration will also be needed as to whether to address leakage issues at international borders given that electrons do not respect either state or national borders.

Regulatory Authority—As the wholesale markets are an effective tool to incorporate GHG emission costs in the electricity sector, federal and state regulatory authority over the electricity sector needs to be harmonized to ensure that the goals of any Congressionally-mandated program are achieved effectively. Today, the wholesale electricity markets are regulated by the Federal Energy Regulatory Commission (“FERC”) while Renewable Energy Certificates (“RECs”) and Zero Emissions Certificates (“ZECs”) are created by state legislation and overseen by state commissions through regulatory requirements on load serving entities.⁶

PJM does not believe there needs to be a single ‘super-regulator’ for GHG regulation. However, it is important that the Congress ensure that the existing statutes such as the Federal Power Act (“FPA”) not work against the regulatory program that Congress envisions, Sections 205 and 206 of the FPA require that the rules governing power markets be just, reasonable and not unduly discriminatory. It is not clear that a GHG program would, absent clarity from Congress, be compatible with the FPA’s requirements of nondiscriminatory treatment of all suppliers in the marketplace. For example, if the RTO needs to solve a local reliability issue through an out-of-market solution (such as through a Reliability Must Run agreement), can the RTO take the relative carbon intensity of one solution vs. another into account without running afoul of the nondiscrimination requirements of the FPA? Can the transmission planning process, in approving baseline projects, take carbon reduction into account? These questions and others can be resolved by Congress making clear in any GHG legislation that the FPA’s requirement of nondiscrimination is compatible with the policy goals and directives set forth in the GHG legislation.

The interaction of state authority with federal GHG legislation is a complex issue, especially when the RTO/ISO is called upon to address disparate individual state policies in a single multi-state economic dispatch. Although a state could potentially provide more stringent carbon-limiting requirements on their load serving entities by requiring load serving entities within a given state to purchase generation which is ‘cleaner’ than what the national standard may apply, RTOs/ISOs would then need to implement various market adjustments such as to address leakage depending on the nature of that state legislation. PJM asks that the Committee

⁴ Moreover, the ability of a state to bar those out-of-state resources from serving customers in the carbon-regulated region is limited by the Commerce Clause. See *Philadelphia v. New Jersey*, 437 U.S. 617 (1978).

⁵ In the absence of national regulation, there are a variety of tools, including border adjustments, which RTOs and ISOs can implement to limit the impact of leakage on both the regulated region and the non-GHG regulated region. PJM has outlined one such plan, which can be accessed at <https://pjm.com/-/media/committees-groups/task-forces/cpstf/20190826/20190826-item-03-economic-dispatch-and-border-adjustments-updated.ashx>. The California ISO has undertaken similar initiatives to address leakage issues eroding the goals that California state GHG regulation was designed to achieve.

⁶ In the case of PJM EIS, PJM’s affiliate provides the service of creating and tracking RECs under contract for specific states.

engage the RTOs/ISOs in this important implementation issue should the Congress decide to allow states to regulate GHGs at a level that exceeds or otherwise differs from a single national standard.

Bulk Power Reliability—Pricing of carbon will significantly advance the competitiveness of zero emission resources as compared to more carbon-intensive resources. However, at least under today’s technology, grid reliability cannot be maintained solely through wind and solar technologies. Moreover, although nuclear is often seen as an important ‘bridge’ resource, the grid of the near term future will need to attract a host of flexible resources to make up for the variable nature of wind and solar generation.⁷ For these reasons, RTOs and ISOs will need to continue to look to fossil generation (predominantly natural gas generation) to provide essential reliability services. In crafting legislation, the Committee should ensure that RTOs/ISOs retain the ability to procure resources needed for reliability and that the pricing of carbon does not render those fossil resources needed to meet reliability cost prohibitive or otherwise difficult to maintain and operate.

The specific design of a GHG regulatory scheme can have a particular impact on the cost of maintaining reliability. The existing wholesale markets can be adjusted to directly incorporate the purchase of capacity or energy. In the alternative, a separate market for Renewable Energy Certificates (“RECs”) or other Clean Energy Attribute Credits can operate alongside the existing markets and influence the generation fleet and the overall cost of electricity. In either event, compliance with federal GHG legislation should not be so costly as to make either the supply of resources needed to maintain reliability cost prohibitive or so proscriptive as to limit how an RTO/ISO can ensure grid reliability while meeting the goals set forth in the legislation.

Transmission Development—As the resource mix evolves into dependence on more renewable resources, the need for additional high voltage transmission to move potentially remote renewable resources to population centers will become more important. On the flip side, PJM has seen a growth in distributed resources, declining load growth and significantly reduced congestion, each factor of which limits the number and size of traditional ‘baseline’ transmission planning expansion projects.

Today, through its Regional Transmission Planning Process, PJM can direct an expansion of the transmission grid in order to address reliability violations, to enhance market efficiency and to implement identified state public policies.⁸ The costs of expansions of the grid for each of these drivers are presently allocated based on a ‘beneficiary pays’ model dictated by the FERC.⁹

By contrast, interconnection of new generation, including renewable generation, is allocated to that generator based on a ‘cost causer pays’ principle. Under the cost causer principle, PJM assigns those costs to upgrade the transmission grid that would not have been

⁷ Although nuclear generation carries with it certain benefits including its non-zero emissions feature, nuclear resources do not have the level of flexibility to respond quickly to changes in renewable output.

⁸ The state public policy driver requires that the state seeking to implement its policies through transmission development pay for any state public policy transmission projects.

⁹ For projects to address reliability violations, the costs of transmission expansions at voltage levels of 500kV or above are split with 50% socialized across the entire RTO Load and 50% based on a flow-based analysis. For facilities below 500kV, the costs of such facilities to address reliability violations are allocated based on a flow-based analysis. Market efficiency projects, irrespective of voltage, are allocated based on a flow-based analysis while state-driven public policy projects are allocated to load in the requesting state.

incurred *'but for'* the generator seeking interconnection. In some cases, the costs of interconnection from remote locations (including off shore wind locations) can be quite high.

Should the Congress decide to regulate GHGs, the FERC will need to reconcile its competing policies of 'beneficiary pays' for baseline reliability projects with its 'cost causer' policy for the interconnection of new generation, particularly renewable generation.¹⁰ Without additional clarity as to which rule to apply under an aggressive GHG regime, cost allocation disputes as to whether 'cost causers' or 'beneficiaries' should pay for the cost of new transmission will continue unabated.

3. If you work in, advise, or are familiar with sectors that are particularly challenging to decarbonize, have you identified any effective (and scalable) solutions that should be included in comprehensive climate legislation?

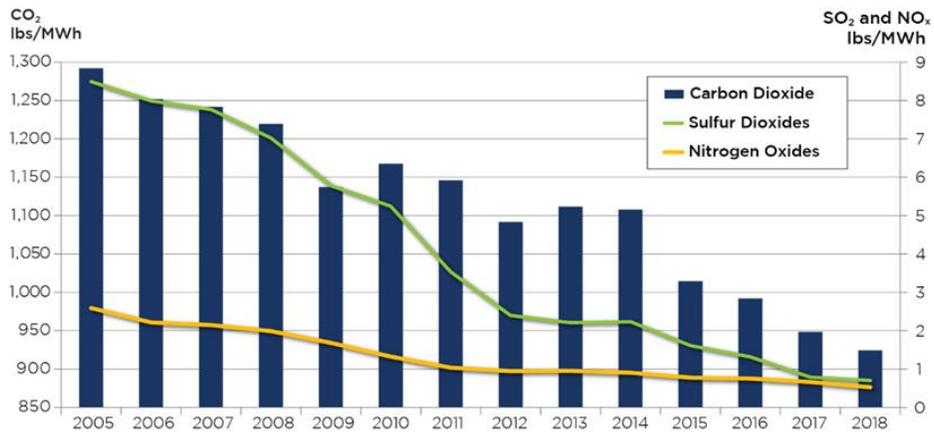
PJM Response—As mentioned earlier, there are generators within PJM that are subject to the Regional Greenhouse Gas Initiative (RGGI). Two states, Delaware and Maryland, and a soon to be third state, New Jersey, participate in RGGI. Fossil fuel generators in RGGI states are required to obtain an allowance for every ton of carbon dioxide they emit. The costs to acquire the necessary allowances are subsequently incorporated into the energy market offers of the applicable generators. This has the impact of increasing the offers of affected carbon-emitting generation, while not impacting the offers of zero carbon emission resources. At the same time, it allows PJM to continue to efficiently dispatch the least-cost resources.

While decarbonization of the electricity grid has been occurring over the past few decades, the rapid pace envisioned by the Committee requires planning and coordination in order to maintain the integrity of the markets and their ability to continue to ensure reliability at least cost. The elements of any legislative package, as outlined above, are important to ensuring that the goals of reliability, affordability and a cleaner environment can be appropriately kept in balance.

4. If your organization has adopted carbon pollution reduction goals, how have those goals – or your plans to meet those goals – evolved over the last decade?

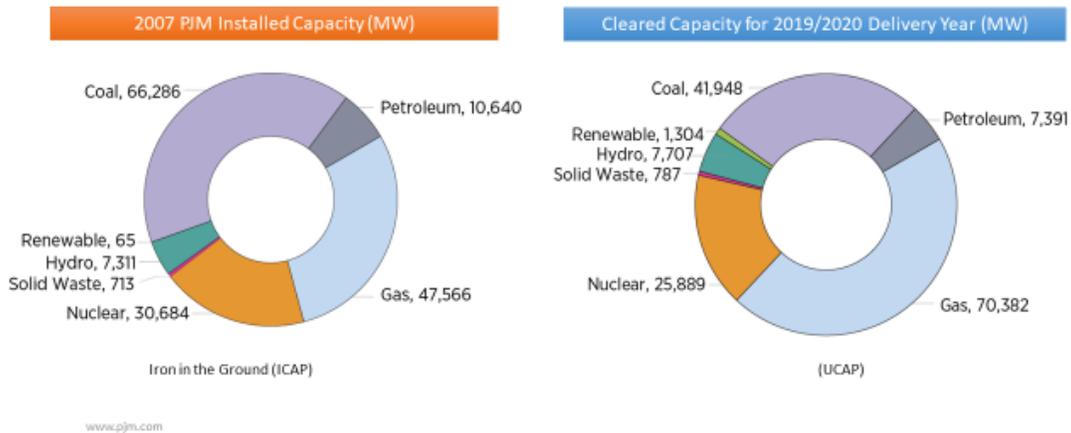
PJM Response—The PJM markets have reflected public policy and economics that have resulted in a significant decline in the air emissions intensity of power generated in PJM. As the graph shows below, carbon dioxide emissions intensity in the 13-state PJM region has declined by 28% since 2005. The combination of the availability of low-priced natural gas in the region (driven by the ability to economically recover natural gas from the Marcellus and Utica shale gas plays) and the MATS rule led to the retirement of a significant amount of coal-fired generation that was no longer economic to operate. These retiring coal units were largely replaced with natural gas generators, which were more efficient and lower emitting. During this time PJM has also seen an increase in demand response and renewable generation.

¹⁰ PJM raised this issue in its Comments to the Commission in the development of Order 1000. The Commission declined to consider the issue deeming it 'out of scope'. *Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities*, Order No. 1000, 136 FERC ¶ 61,051 (2011), *order on reh'g & clarification*, Order No. 1000-A, 139 FERC ¶ 61,132, *order on reh'g & clarification*, Order No. 1000-B, 141 FERC ¶ 61,044 (2012), *aff'd sub nom. S.C. Pub. Serv. Auth. v. FERC*, 762 F.3d 41 (D.C. Cir. 2014).

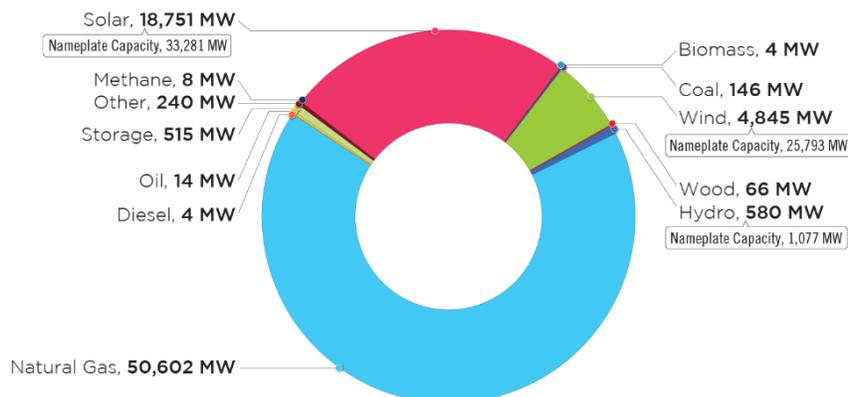


The impact of the markets on driving a cleaner generation fleet can be seen by a comparison of the generation mix in the PJM region in 2007 versus 2019. As can be seen below, approximately 22,000 MW of older coal resources have been replaced with natural gas.

PJM's Changing Fuel Mix



Moreover, as shown below, the PJM queue going forward includes a significant increase in the amount of renewable resources seeking to interconnect to the PJM system.



5. If applicable, what actions has your organization already taken, or do you plan to take, to reduce carbon pollution?

PJM Response—At the request of stakeholders, PJM has initiated a task force with its states and stakeholders to discuss potential frameworks for incorporating a carbon price into its wholesale electricity markets.¹¹ The initiative includes various phases of education on topics ranging from jurisdictional issues related to applying a carbon price to its markets to various market designs that could be used to deal with economic and emissions leakage. In addition, PJM is performing a study looking at the impacts of a carbon price on its wholesale energy and ancillary service markets and resulting generator emissions. The study is modeling the impacts of various levels of carbon prices, different border adjustment options for dealing with power flows from regions with and without a carbon price, and applying the carbon price system-wide and to only a subset of PJM states. The initiative started in July and is scheduled to last for eighteen months.

6. What have been the challenges or barriers to making meaningful carbon pollution reductions, and how have you responded to those challenges or barriers?

PJM Response—See above and, in particular the discussion of leakage in response to Question #2.

7. How can the Federal Government assist you in reducing carbon pollution?

PJM Response—Importantly, the Federal Government has the ability consolidate the various efforts at climate policy into one comprehensive national program. PJM stands ready to assist the Committee in addressing implementation challenges and opportunities with respect to the particular policy choice the Committee seeks to implement through legislation.

8. Are there any additional comments or feedback you would like to add?

PJM Response—As noted previously, although not taking a position on whether Congress should regulate GHG emissions, PJM does wish to continue to serve as an independent neutral source of information for the Committee. Given PJM’s critical role in administering markets and ensuring reliability of the bulk power electric system, PJM wishes to ensure that any legislative program can be implemented reliably, effectively and at least cost to consumers. PJM looks forward to working with the Committee on that important task.

We look forward to continuing to work with Members on both sides of the aisle on these important issues. For additional information on these responses or other needs of the Committee on this important issue, please contact Craig Glazer, PJM Vice President of Federal Government Policy at 202-423-4743 or by e-mail at Craig.Glazer@PJM.COM.

¹¹ PJM Carbon Pricing Senior Task Force, <https://www.pjm.com/committees-and-groups/task-forces/cpstf.aspx>.