

Apr. 9, 2018

U.S. Federal Energy Regulatory Commission
Secretary of the Commission
888 First Street NE
Washington, DC 20426

Re: Docket No. AD18-7-000, Grid Resilience in Regional Transmission
Organizations and Independent System Operators

Thank you for the opportunity to comment in the proceeding in which the U.S. Federal Energy Regulatory Commission (“FERC” or “Commission”) is evaluating the resilience of the bulk power system in regions operated by regional transmission organizations (RTOs) and independent system operators (ISOs). This document constitutes the comments of the Center for Climate and Energy Solutions (C2ES). C2ES is an independent, nonprofit, nonpartisan organization dedicated to advancing practical and effective policies and actions to address our global climate change and energy challenges. We prefer an economy-wide pricing mechanism for addressing climate change, but in the absence of that, we believe the Commission should consider options to ensure that wholesale power markets are internalizing the costs of carbon emissions. The views expressed here are those of C2ES alone and while informed by our conversations with business leaders, do not necessarily reflect the views of members of the C2ES Business Environmental Leadership Council (BELC).

Key comments:

- The Commission should adopt a definition of resilience that applies to acute events and long-term trends. Resilience to acute events is closely related to the concept of reliability and is critical to the operation of interstate electricity grids. However, a suitable definition for resilience to long-term trends, such as climate change, is lacking. Here, the Commission is well-suited to play a helpful role with input from industry leaders, who have begun to tackle this definition.
- C2ES recommends that the Commission convene technical conferences with stakeholder working groups, including the Department of Energy’s

Partnership for Energy Sector Resilience, to establish appropriate definitions of resilience and methods for RTOs and ISOs to suitably assess resilience, and on pricing carbon in wholesale markets.

- Just and reasonable rates should internalize the externalities associated with carbon emissions, which would be achieved by pricing carbon in the wholesale markets. Reducing carbon emissions in the near-term can help prevent the worst impacts of climate change in the future; unmitigated climate change would impair the ability of the power system to reliably deliver power.
- Just and reasonable rates should be prudent as referenced in the concurrence from Commissioner Chatterjee; they should be reasonable in light of what is known and knowable about carbon emissions.

We appreciate the Commission’s efforts to evaluate the resilience of the bulk power system, and we do believe that additional action is warranted.

Climate change should be part of the definition and scope of grid resilience

First, we applaud the Commission’s stated goal of developing a common understanding among the Commission, industry, and other stakeholders of what resilience of the bulk power system means and requires. In the January 2018 Order, the Commission lists many of the relevant factors, such as wholesale electric market rules, planning and coordination, NERC standards, transmission planning, mandatory reliability standards, emergency action plans, inventory management, and routine system maintenance. An additional cross-cutting issue that should be considered is climate change, both mitigation of climate change and resilience to its physical impacts. The Commission proposes the following definition of resilience from the National Infrastructure Advisory Council:

The ability to withstand and reduce the magnitude and/or duration of disruptive events, which includes the capability to anticipate, absorb, adapt to, and/or rapidly recover from such an event.¹

¹ 162 FERC ¶ 61,012 (Jan. 8, 2018) at ¶23, citing National Infrastructure Advisory Council, *Critical Infrastructure Resilience Final Report and Recommendations by the Council* at 8 (Sep. 8, 2009).

We agree that this is a useful definition but note that it falls short of addressing resilience to long-term trends. These trends can be disruptive, and the electricity system should be encouraged to take action to withstand and anticipate them. For example, increasing daytime and night-time temperatures reduce the capacity of bulk transmission lines to carry power, and increasing drought risk threatens cooling water supplies for many generating stations.² We encourage the Commission to define resilience that applies to both acute events and long-term trends. Since industry is beginning to plan for these trends, we recommend FERC convene a technical workshop with industry experts so that existing best practices can inform the definition.

As the Commission recognized in its Jan. 8, 2018 Order, ensuring resilience requires a determination of which risks to the grid we are going to protect against and which steps are needed to ensure that those risks are addressed.³ C2ES recommends that the Commission should convene technical conferences to consider climate change as part of both of those tasks because of the acute and long-term risks that climate change poses to the electricity system.

Based on our experience, the contribution of carbon emissions from power generation (and other sources) to climate change and planning for the physical impacts of climate change should all be considered by the Commission as part of this definition because reducing carbon emissions in the near-term can prevent the worst impacts of climate change in the future and because unmitigated climate change will impair the ability of the power system to reliably deliver power in the future.⁴ Additionally, it will increase the likelihood that resilience

² U.S. Department of Energy (DOE), *U.S. Energy Sector Vulnerabilities to Climate Change and Extreme Weather*, (Washington, DC: DOE, 2013), available at <https://www.energy.gov/sites/prod/files/2013/07/f2/20130716-Energy%20Sector%20Vulnerabilities%20Report.pdf>.

³ 162 FERC ¶ 61,012 at ¶24.

⁴ See, e.g., U.S. Department of Energy, *A Review of Climate Change Vulnerability Assessments: Current Practices and Lessons Learned from DOE's Partnership for Energy Sector Climate Resilience* (2016), available at <https://energy.gov/sites/prod/files/2016/10/f33/A%20Review%20of%20Climate%20Change%20Vulnerability%20Assessments%20Current%20Practices%20and%20Lessons%20Learned>

strategies will be successful.⁵ States, cities, and businesses continue to move forward with efforts to reduce carbon emissions to stave off the worst impacts of climate change, such as sea level rise, extreme weather, drought, and changed precipitation patterns, all of which contribute to the disruptive events cited in the proposed definition of resilience. Reducing carbon emissions is an important part of reducing the magnitude of these disruptive events.

Just and reasonable rates must consider the costs of climate change

Because of the connection between near-term carbon emissions and long-term resilience, we believe any action on grid resilience is incomplete without reviewing how to incorporate a price on carbon in wholesale power markets. The Commission is tasked with oversight of wholesale power markets to ensure that rates are just and reasonable and not unduly discriminatory or preferential. As Commissioner Glick noted in his concurrence to the Jan. 8, 2018 Order, “[u]tilities face diverse challenges, including the threat of cyber or physical attacks and natural disasters, such as the extreme weather events that are occurring more frequently as a result of climate change.”⁶ As stakeholders, our perception is in light of the growing body of data surrounding the rapid onset of climate impacts,⁷ it is hard to grasp how existing RTO/ISO tariffs could be just and reasonable if they fail to account for the externalities associated with carbon emissions. The markets are not properly reflecting the social cost of carbon emissions; these externalities should be reflected in power prices. A price on carbon would ensure that rates are just and reasonable without being discriminatory in favor of any specific technology or fuel.

We believe that the Commission has done a good job of ensuring reliability over the short-term, as evidenced by its multi-year effort to review and improve the scheduling and coordination of wholesale natural gas and electricity market

[%20from%20DOEs%20Partnership%20for%20Energy%20Sector%20Climate%20Resilience.pdf](#)

⁵ For a description of climate change risks facing the power sector see id.

⁶ 162 FERC ¶ 61,012, Commissioner Richard Glick, Concurrence (Jan. 8, 2018).

⁷ USGCRP, 2017: *Climate Science Special Report: Fourth National Climate Assessment, Volume I* [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 470 pp, doi: [10.7930/J0I964J6](https://doi.org/10.7930/J0I964J6).

processes as well as its specific examination of the 2014 Polar Vortex. The Commission’s efforts around the North American Electric Reliability Corporation Critical Infrastructure Protection standards are also commendable. Building on these successes, the Commission needs to focus on long-term resilience and the changing frequencies of extreme weather events that are caused by climate change. Reducing carbon emissions that contribute to climate change is part of that task. As Commissioner LaFleur highlighted in her concurrence to the Jan. 8, 2018 Order, “the Commission should continue to focus its efforts not on slowing the transition from the past but on easing the transition to the future.”⁸ We, echoing Commissioner Glick’s recommendation on climate change, encourage “RTOs and ISOs to use this opportunity to undertake a serious review of these challenges along with other concerns regarding the resilience of their system.”⁹

Our priority is an economy-wide price on carbon to reduce the risks of climate change on the American economy, but absent that, we encourage wholesale power markets to incorporate a price on carbon. Because of the connection between near-term emissions and long-term grid resilience, it is appropriate to consider such a pricing mechanism as part of this proceeding on grid resilience. In its Jan. 8, 2018 Order, the Commission emphasized that “for more than two decades now, support for markets and market-based solutions has been a core tenet of Commission policy”¹⁰ because of the economic benefits to consumers that markets provide.¹¹ In practice, “the Commission relies on competition in approving market rules and procedures that, in turn, determine the prices for the energy, ancillary services, and capacity products . . .”¹² A price on carbon would be in line with these principles and would help achieve grid resilience over the long-term. It would also further Commissioner Glick’s recommendation that “RTOs and ISOs should consider how best to mitigate these challenges *within* their markets and *without* prejudging what technology or fuel-type provides the best solution.”¹³

⁸ 162 FERC ¶ 61,012, Commissioner Cheryl LaFleur, Concurrence (Jan. 8, 2018).

⁹ Id at Commissioner Richard Glick, Concurrence (Jan. 8, 2018).

¹⁰ 162 FERC ¶ 61,012 at ¶9.

¹¹ Id at ¶10.

¹² Id at ¶9.

¹³ Id at Commissioner Richard Glick, Concurrence (Jan. 8, 2018).

For these reasons, we believe that further action by the Commission is warranted, such as a technical conference focused on how RTOs/ISOs could implement a price on carbon in their respective regions.

Including climate change costs in rates is prudent

We believe that our recommendations on pricing carbon are consistent with Commissioner Chatterjee’s emphasis on the prudence of interim measures to promote grid resilience.¹⁴ Prudence is often evaluated by considering the reasonableness of a decision in the context of the facts that are known and knowable. One could argue that existing rates are not just and reasonable unless they are prudent. With respect to what is known and knowable about carbon dioxide, climate impacts are being felt in real-time. What’s known is that there is a market failure because externalities related to climate change are not incorporated into prices. The Commission is therefore aware that current prices are inefficient. From a legal perspective, the Supreme Court held that greenhouse gases like carbon dioxide “fit well within the Clean Air Act’s capacious definition of ‘air pollutant’ . . .”¹⁵ Federal agencies use estimates of the social costs of carbon dioxide, methane, and nitrous oxide.¹⁶ These estimates were developed by economists as analytical tools to calculate the costs and benefits of reducing greenhouse gas emissions, including the evaluation of alternatives.

Considerations of carbon pricing for fossil fuel-fired power plants

Some stakeholders have requested that certain fossil fuel-fired power plants receive special treatment in wholesale power markets because of their unique fuel supply and operational characteristics. Because of this interest, we would also like to address fossil fuel-fired power plants specifically. We believe that over the long-term, a price on carbon may be helpful for fossil fuel-fired power

¹⁴ 162 FERC ¶ 61,012, Commissioner Neil Chatterjee, Concurrence (Jan. 8, 2018).

¹⁵ *Massachusetts v. EPA*, 549 U.S. 487, 532 (2007).

¹⁶ Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12,866 (May 2013, revised August 2016); Addendum to the Technical Support Document for the Social Cost of Carbon: Application of the Methodology to Estimate the Social Cost of Methane and the Social Cost of Nitrous Oxide (August 2016).

generation using coal and natural gas because it could encourage investment in carbon capture technology. A recent report by Moody's Investors Service warned that "U.S. coal production will continue a steady, secular decline without policy support for, and continued investment in, carbon capture and storage technology."¹⁷ At the same time, the upfront capital investment to retrofit fossil fuel-fired power generation with carbon capture is not likely to be recouped in competitive power markets. States are concerned about this issue. Last year, a Western Governors' Association work group published a white paper describing how the carbon reduction benefits of carbon capture are not valued by competitive power markets which disadvantages investments in dispatchable low-carbon generation like fossil fuel-fired power plants with carbon capture technology.¹⁸ The white paper describes how electricity market design could better accommodate carbon capture, such as by developing a low-carbon capacity standard and providing a financial value for carbon dioxide reductions in generation dispatch. We believe a carbon price adder in wholesale markets would play this role, thus providing long-term policy support and price incentives for the technological innovations needed to develop and deploy carbon capture technology.

Sincerely,



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President
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¹⁷ Moody's Investors Service, [US Production to Continue Sharp, Secular Decline Absent Carbon Capture Development](#) (Jan. 25, 2018).

¹⁸ Western Governors' Association State CO₂-EOR Deployment Work Group, [Electricity Market Design and Carbon Capture](#) (2017).