(Revised and corrected)

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Technical Conference on Environmental Regulations and Electric Reliability, Wholesale Electricity Markets, and Energy Infrastructure	Docket No. AD15-4-000

PRELIMINARY COMMENTS OF WIRES
FOR THE FEBRUARY 19 TECHNICAL CONFERENCE IN WASHINGTON

For purposes of this proceeding, WIRES[1] neither supports nor opposes the Clean Power Plan ("CPP"), an carbon reduction program proposed by the Environmental Protection Agency ("EPA") under Section 111(d) of the Clean Air Act ("CAA"). In our estimation, today's technical conference is primarily about whether the CPP will work as proposed in light of technical aspects of the electric system and whether the Federal Energy Regulatory Commission ("Commission") can constructively assist CPP implementation to protect the reliability and economic efficiency of power markets, ensure the efficacy of Commission policies, and help emphasize the importance of electric transmission investment to the CPP.

WIRES contends that the Commission can provide constructive assistance that will help states and the industry implement this unprecedented process, *even though the ultimate outcome of the Administration's low-carbon initiatives do not ultimately lie within the Commission's jurisdiction.* The Commission's interests under both the Federal Power Act and the Federal Power Act are affected by the CPP. It is in these areas that we focus our brief comments.

---

[1] WIRES is an international non-profit association of investor-, member-, and publicly-owned electric transmission providers, renewable resource developers, regional transmission organizations, and economic, technology, and policy consultants whose sole mission is promotion of investment in the high-voltage electric transmission. A description of its membership, its principles, and its activities are available at www.wiresgroup.com. WIRES educational efforts include several studies of the operational, environmental, and economic benefits of transmission and the regulatory barriers to development as well as public briefings about transmission operations and policies. A forthcoming study conducted by The Brattle Group will further elucidate the costs and risks of not making transmission investment sufficient to obtain the flexibility and other benefits of a stronger transmission grid. WIRES submitted to EPA more extensive comments on the Clean Power Plan, which we attach here.

WIRES believes that planning for adequate electric transmission under the auspices and guidance of Order No. 1000[2] and the growth and integration of the bulk power markets that figure so prominently in the Commission's agenda are also important to the CPP. Indeed, well-planned transmission may eliminate some of the risk and cost of the CPP. However, without fully exploring electric transmission expansion and upgrades as part of the CPP Building Blocks that state implementation plans ("SIPs") will employ, the EPA assumes that planners will provide sufficient transmission capacity to ensure reliable service and the feasibility of Block 2 and 3, because they always have, regardless of when and where high carbon emitting plants are retired or replaced by lower carbon alternatives.[3] Despite the probability that the CPP will require new transmission additions, the CPP does not encourage states to consider transmission in their various implementation plans or to consider that transmission planning oftentimes is a multi-state enterprise, under both normal and extraordinary circumstances. Finally, the achievement of carbon targets presumes that transmission projects can be planned, authorized and permitted, sited, and constructed within the confines of the EPA's expectations.

A great deal of uncertainty will be created by the CPP and the potentially diverse outcomes the CPP may produce. Transmission planners do not know with certainty the future state for which they are planning. The uncertainty that they and policy makers experience flows from not knowing with confidence the schedule under which fossil plants will be retired or which additional non-fossil resources will be marshalled to sustain reliable service. While often taken as a reason not to consider transmission solutions or strategies that would strengthen regional and interregional systems, uncertainty is in reality precisely why transmission investment now is so important. A strong grid can help ensure that the transformative impacts of the CPP on the generation mix and system flows do not undermine electric reliability while also ensuring that the CPP itself is achievable as a practical matter. In other words, transmission provides the optionality and flexibility to accommodate the various possible end-states that the rule will drive and about which we now can only speculate. This entails thinking strategically about transmission.

This comment provides some basic responses to the questions posed by the Commission in its January 6, 2015 Supplemental Notice:

---

2 *Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities*, Order No. 1000, FERC Stats. & Regs. ¶ 31,323, at PP 484 (2011), order on reh'g, Order No. 1000-A, 139 FERC ¶ 61,132, *order on reh'g*, 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. Aug. 15, 2014) ("Order No. 1000").

3 "The third consideration supporting a conclusion regarding the adequacy of the infrastructure is that pipeline and transmission planners have repeatedly demonstrated the ability to methodically relieve bottlenecks and expand capacity." 79 *Fed. Reg*. at 34864.

1. What mechanisms can be used to identify potential infrastructure needs and ensure that adequate infrastructure will be built in sufficient time to comply with the proposed rule? Are additional mechanisms needed?

Any fundamental improvements to the CPP itself will have to be the EPA's responsibility. Like other EPA programs, the CPP's implementation process relies on individual state implementation. However, its proposal also acknowledges the importance of the interconnected nature of the electric system and, to the extent that compliance necessitates the development of transmission, the regional planning and cost allocation mechanisms devised under Order No. 1000 in anticipation of realignments in the generation and transmission sectors may prove useful to states, individually or in regional collaboration. The Commission's regional and interregional processes for planning which transmission projects should be constructed and how the costs should be allocated and recovered, based on the benefits that projects provide, including those that incorporate the results of state integrated resource planning, are particularly suited to the challenges of implementing the CPP. Given the demonstrable need for new and upgraded transmission in most regions of the country and the widely anticipated switch to natural gas generation, the CPP's ambitious agenda cannot work without ensuring that changes in the type and location of generation is also accompanied with the necessary delivery capability. To our knowledge, only initial steps have been taken to study the specific impacts of the CPP on the grid. The Commission may find that its policies require it to convene regional stakeholders to systematically explore those potential impacts.

One of the major objectives of Order No. 1000 is to ensure that utilities are able to meet public policy requirements in a cost-effective manner, so that low-cost but location-constrained renewable energy resources are able to access markets and thereby contribute to meeting renewable portfolio standards. Since the goals of Building Block 3 are based on the amount of in-state resources, it is not clear how any imports of renewable energy from outside the state or region will be counted toward individual state goals. The EPA explicitly recognized that states may develop state-only compliance plans or collaborate with other states to develop multi-state plans, which suggests that a regional or interregional consideration of transmission needs may be required. More to the point, Order No. 1000 purposely incorporated planning for public policy objectives into its thinking and there is no greater, more impactful public policy currently challenging planners than the CPP itself. In addition, the location of, availability of, and operational characteristics of the new natural gas-fired generation that will replace higher-emitting facilities and/or augment variable sources of generation that the CPP also encourages tends to create another set of uncertainties.

As this Commission recognized in reviewing the record submitted in the Order No. 1000 proceeding, "No commenter has contested the need for additional transmission." Since the lengthy downturn in investment since 1980, the industry has responded with increased transmission investment. The tangible evidence of

grid modernization is growing and can be seen in the Texas Competitive Renewable Energy Zone projects ("CREZ"), the Multi-value Project portfolio in the Midcontinent ISO, the California Renewable Energy Transmission Initiative ("RETI"), the 20-year Integrated Transmission Plan Assessment in the Southwest Power Pool, and numerous incremental grid expansions and improvements. That should be just the beginning. Even though the planning, siting, and cost allocation impediments to transmission persist in varying degrees, there undoubtedly exists a need to overcome those impediments because there is a need for sustained investment to address a variety of operational and policy challenges. However, the CPP is an extraordinary challenge that the Commission could not have anticipated but it is one that makes transmission investment all the more important.

WIRES submits that, in Order No. 1000, the Commission has already helped establish mechanisms that the EPA, and the states it charges with implementing the CPP, can use to address the need for transmission. However, it will be important for the states within Regional Transmission Organizations ("RTOs") and in non-RTO markets to coordinate within the emerging regional and inter-regional planning processes and even to utilize those processes to convene stakeholders to help develop the SIPs in response to the CPP. We acknowledge that the methods of responding to the CPP may vary, depending on the preferences of the states. Accommodating state and regional needs and characteristics is important, but the SIPs will be more effective to the extent that states collaborate to use the technical knowledge available from state and federal economic regulators and development personnel as well as the industry expertise brought to bear through the transmission planning and cost allocation processes that the Commission has promoted.

2. What are the primary challenges, if any, in coordinating planning processes to evaluate energy infrastructure needs?

Thanks to the Commission, the difficulties inherent in coordinating the multiple interests in any RTO or non-RTO transmission planning processes are quite familiar. As noted above, Order No. 1000 is designed to facilitate the evaluation of project proposals, whether through competitive processes, integrated resources planning, or other state, regional, and interregional planning processes. Planning and cost allocation methods and outcomes under that rule nevertheless tend to be very different. Better coordination at the regional and interregional levels would yield important benefits – resilience, cost savings, liquid markets, resource diversity, and potential emissions reductions.

WIRES submits that, beyond the mere availability of planning mechanisms, the EPA must become as aware, as is this Commission, that challenges remain. Those challenges require the EPA to make a purposeful effort to incorporate transmission solutions into the CPP. Among the challenges are these:

A. Major transmission development will lag other developments for identifiable reasons. To restate the obvious, the pathway to planning, approval, and construction of interstate transmission projects under state and federal law is more complex than that for natural gas pipelines, which are authorized principally by this Commission, without regional planning. Because the increase in transmission investment in recent years may represent the low-hanging fruit, leaving larger, more regionally and inter-regionally significant projects with longer planning, permitting, and construction cycles yet to be done, the current levels of transmission investment may not be sustainable. Transmission's 5-10 year development cycle will not fit comfortably within the CPP compliance "glide path."

B. Interregional coordination under Order No. 1000 is still in its infancy. It has not advanced any significant transmission solutions across regional "seams." However, even major projected transmission developments may be in danger of stalling. MISO has not planned another portfolio of transmission expansions since the MVP portfolio in 2011, even though it acknowledges that projected coal plant retirements could be as high as 26.6 GW. SPP has made clear that there will be a hiatus in major project development. The CPP will require reassessment of such conclusions.

C. As the forthcoming study by The Brattle Group will show, much of the current transmission planning process fails to incorporate consideration of the wide range of economic benefits of individual projects or portfolios of projects or to approach transmission from a risk management perspective that accounts for the high cost and risks of <u>not</u> building adequate transmission infrastructure. This failing approach militates against larger, regional or interregional transmission solutions that are not solely justified on reliability grounds.

D. Order No. 1000 requires public policy projects to be considered but it does not require stakeholder processes to arrive at early resolution of cost allocation issues for that category of projects. Cost allocation is a gateway issue but, for public policy projects, a lack of stakeholder resolution of the issue upfront could slow fair consideration such projects in an RTO planning process. It is axiomatic that in most regional planning processes, projects classified as reliability projects move faster through the process and competitive projects face greater delays. In those states and regions where cost allocation has not been settled for this category of projects, the Commission should correct the apparent problem that CPP-driven transmission may be seriously disadvantaged in this regard.

These and other factors cast doubt on the ability of transmission planning to contribute to the CPP's emissions reduction targets *within the time constraints* EPA establishes. The timing and sequencing of SIPs development should be established with a greater appreciation of regulatory lag in transmission development than is

now reflected in the CPP. Any hope of utilizing transmission as a means of implementing Building Block 3, and perhaps Building Block 2, to achieve individual state or regional emissions targets will likely depend on the an awareness of the time it takes to expand or upgrade the system and the kind of coordination represented by the Commission's Order No. 1000 processes. Although it is not empowered to help implement the CPP, this Commission must continue to emphasize, through its policies and consultation with EPA, the importance of transmission to addressing and ultimately overcoming the uncertainties that states and planners will confront.

3. How could various compliance approaches impact the need for additional infrastructure?

The CPP leaves to the states, individually and in collaboration, to decide which of the approaches articulated in the four Building Blocks, individually or in combination, will work most effectively to meeting the CPP's carbon targets. The Building Blocks will work more or less well for individual states or regions, depending on each state's indigenous resource base and a combination of other factors. However, the outcomes may not be easy to predict. For example, it is not entirely clear how credit for compliance with any Building Block will be allocated, especially given the dynamics of multi-state energy markets and cross-border energy delivery. Additional transmission investment may therefore be more or less important in specific cases if compliance depends on access to new, perhaps distant, resources.

It is nevertheless clear that transmission provides flexibility, optionality, insurance, and a variety of benefits in any market. It will be critical to delivering high quality, low carbon, and often lower cost renewable energy that is far from customers and currently barred from development because of lack of market access. The National Renewable Energy Laboratory ("NREL") estimates that there exists 11,000 GW of utility scale photovoltaic solar potential in the U.S. Even today, major U.S. wind power resources remain untapped. A great deal of it is unrealizable without transmission. Most of these resources are beyond the reach of today's transmission system. Where meeting carbon targets requires heavy reliance on Building Block 3, transmission is therefore especially critical.

Building Block 2 describes the potential benefits of re-dispatching the system from higher- to lower-emitting generation resources. WIRES believes natural gas generation will be increasingly important, in part because of current fuel prices and in part because of the CPP. The potential increase in natural gas-fired generation from both existing and new units as well as the increased possibility of new pipeline expansion suggests that the flows on the electric system will change, in some cases fundamentally. This development implies that transmission upgrades and expansion will be a major part of accommodating those changes.

Finally, the recent London Economics study[4] of alternative technologies such as distributed generation, demand response, and energy efficiency makes clear that, as important as these technological developments are to grid resilience, reliability, and efficiency, they do not obviate the need for a strong transmission system. We therefore conclude that, while transmission is central to parts of the CPP's methodology, the range of benefits that transmission is capable of providing should not be ignored regardless of which Building Blocks come into play in particular circumstances.

4. Are adaptations to current Commission policies needed to facilitate the infrastructure needed for compliance with the proposed Clean Power Plan?

WIRES does not advocate basic changes in Commission policy. While implementation of Order No. 1000 continues to unfold and the Commission has a better appreciation of how it is working, the heretofore unknown impacts of the CPP on the bulk power system may suggest new ideas and approaches to the Commission. We can say now that any new (not currently constructed) transmission development that may be necessary for Building Blocks 2 or 3 is not likely to be ready to operate within the earliest performance expectations of the CPP. If the Commission can resolve to address the several pending issues under Order No. 1000 and to hold fast to, and if need be clarify, its policies on equity returns which remain subject to repeated challenges, it would send more positive signals about the transmission outlook. The CPP potentially requires significant adjustments for both policy makers and for the industry. WIRES believes that current Commission policies can be adapted or applied, potentially with EPA's cooperation, to help rationalize the transmission and power market aspects of the CPP so that the chances of a sustained effort to expand the Nation's transmission system will be immeasurably improved. Whether the CPP goes forward as proposed or not, a persistent focus on the need for infrastructure, and for regulatory measures that will advance investment in that infrastructure, will be critical to the Commission's own pro-competition, pro-market policies.

---

[4] Frayer and Wang (London Economics LLC, for WIRES), *Market Resource Alternatives: An Examination of New Technologies in the Electric Transmission Planning Process*, October 2014. Available at www.wiresgroup.com.

Respectfully submitted,

James Hoecker
Counsel to WIRES
James.Hoecker@huschblackwell.com
Phone: 202-378-2300

Dated: February 18, 2015

Attachment 1

WIRES Comments to EPA on Clean Power Plan

WIRES VOICE OF THE ELECTRIC TRANSMISSION INDUSTRY
C/O HELP PLLC, 750 SEVENTEENTH STREET N.W. SUITE 1000 WASHINGTON, D.C. 20006 TEL. 202-378-2300

December 1, 2014

Hon. Regina McCarthy, Administrator
United States Environmental Protection Agency
EPA Docket Center, EPA (EPA/DC), Mail code 28221T
1200 Pennsylvania Ave., N.W.
Washington, DC 20460

Attention: Docket ID No. EPA-HQ-OAR-2013-0602

Re: Comment of WIRES on Carbon Pollution Emission Guidelines for Electric Utility Generating Units

Dear Madam Administrator:

WIRES hereby submits its Comments on the proposed Clean Power Plan ("CPP"), formally the proposed Carbon Pollution Emissions Guidelines under Section 111(d) of the Clean Air Act, 42 U.S.C. §7411 (2014) (79 Fed. Reg. 34830, June 18, 2014) ("CAA"), in the referenced docket. Absent a further extension of time to comment, these comments will also constitute WIRES' response to the recent Notice of Data Availability ("NODA")[1] in which the Environmental Protection Agency ("EPA") opens aspects of the proposed guidelines for further comment. In response to previous comments, the NODA reopens for additional comment certain timing and coordination issues related to the phase-in of natural gas and renewable generation under state plans.

[1] EPA Notice of Data Availability, *Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units*, October 27, 2014, available at: http://www2.epa.gov/sites/production/files/2014-10/documents/20141028noda-clean-power-plan.pdf, accessed Nov. 10, 2014.

I. INTRODUCTION AND SUMMARY

A. What Is WIRES?

WIRES is an international non-profit association of investor-, member-, and publicly-owned electric transmission providers, renewable resource developers, regional transmission organizations, and economic, technology, and policy advisory firms. WIRES' sole mission is promotion of investment in the high-voltage electric transmission.[2] WIRES' educational efforts include several studies of the operational, environmental, and economic benefits of transmission and the regulatory barriers to transmission development as well as public briefings about transmission operations and policies. Our studies demonstrate that a robust electric transmission grid will promote advanced technological solutions, access to more diverse, secure, and environmentally beneficial resources, economic efficiency, and stronger and more competitive power markets, all of which will benefit consumers now and for years to come.[3] Finally, we stress that WIRES' support for transmission investment pertains to transmission facilities and services for all generation resources across the integrated high voltage grid. As the only major international industry association that can speak to the practical implementation of the proposed rules *solely* from the perspective of the high-voltage transmission grid, WIRES thanks the EPA for the open and iterative approach it has taken in tackling this difficult subject matter.

WIRES' focus on these comments is the importance of transmission to the CPP's goals and to the evolution of the electric system generally. It does so in the hope that the EPA will adopt a more flexible stance, informed by the challenges we see in the CPP implementation

---

[2] These comments are being submitted on behalf of WIRES' Full Supporting Members, unless otherwise noted.

[3] A full description of WIRES membership, its principles, and its activities is available at http://www.wiresgroup.com/.

process. Despite the legitimate environmental and economic objectives of the EPA's proposals, the response of industry thus far indicates that the CPP poses substantial risks and challenges to this critical industry and may be infeasible in terms of projected timelines and the inclusiveness and structure of state procedures. Because the CPP could clearly alter the operation of such an elaborate mechanism as the integrated North American electric system, the sheer complexity of this undertaking increases the potential for unintended consequences. **WIRES therefore recommends** that the EPA move forward with a deeper appreciation of the likely impacts that the CPP will have on the high-voltage transmission system and, conversely, the risks and costs of ignoring the role of the high-voltage grid in bridging the gap between diverse, high quality, low carbon renewable resources and the bulk of electricity consumers, in relieving chronic and costly congestion of the power system, and in shifting the dispatch of natural gas-fired electric generation resources.

While the proposed CPP is primarily designed to establish targets for changing the patterns of energy production and consumption and to achieve the state-specific goals enunciated, the delivery system between generating resources and electricity customers will powerfully affect the extent to which those targets are achievable, timeframe within which they can be achieved, and the economic efficiency of the CPP approach. The strategic value of expanding and upgrading the Nation's high-voltage transmission system cannot be overestimated. As we strongly contend in this comment, the EPA has yet to fully consider either the importance or the magnitude of the transmission investment that will be required in most regions if its proposed emissions reduction targets are to be met within the timeframe that the EPA anticipates. WIRES therefore respectfully request that the EPA consider the following comments and requests inclusion of its ideas and recommendations in the Final Rule.

B. Summary Of WIRES' Comments

Although the EPA's CPP is principally about changing the "fuel mix" of the Nation's electric generation fleet in the interest of reducing carbon emissions, WIRES believes that the EPA may not fully appreciate the profound impact that the CPP could have on the electricity industry, its markets and operations, and ultimately its regulation and, perhaps more importantly, the positive effect that transmission can have on achieving the goals of the CPP. To be clear, WIRES neither endorses nor opposes the legal and administrative approach that the EPA seeks to adopt. However, WIRES points out that the delivery of bulk power within and across states and regions will be critical to the successful implementation of Congress' goals under the CAA and therefore to the CPP and, as we have often said elsewhere, to the creation of a truly 21st century electric grid that is reliable, resilient, and efficient. The EPA's reliance on the near-term deployment of renewable energy resources, the move to lower carbon natural gas-based generation, and increased energy efficiency heightens the importance of expanding and upgrading the Nation's transmission network. In other words, the high-voltage transmission grid should be considered in finalizing the CPP – both in terms of the impact that the rule will have on reliable operations of the electric system and the role that transmission will play in implementing the rule.

The CPP is predicated on the integrated and interdependent character of the electricity system, of which transmission is the critical integrating element. The EPA nevertheless has not adequately addressed transmission considerations as an aid to achieving its emissions reduction goals. Nor has it directed, incented, or even encouraged states to take transmission into consideration when developing implementation plans. It has not asked states to work in conjunction with each other, with the Federal Energy Regulatory Commission ("FERC") and its

landmark Order No. 1000 planning processes,[4] or with economic regulators and industry experts to employ transmission's capabilities in service to the CPP. WIRES stresses that the EPA should not assume that transmission capacity will be adequate to support the CPP's goals, that renewable energy and natural gas-based generation will be easily integrated into the system, or that congestion can be effectively eliminated. It should not ignore the challenges facing infrastructure development, the need for coordinated and effective planning and ratemaking policies, or the resources and time required for siting and permitting processes. This is not to say that the EPA is responsible for curative measures in each of these instances; it *does* mean that the EPA should, first and foremost, consider how transmission expansion and upgrades can assist accomplishment of its goals and, then, actively consider how the obstacles, costs, and risks associated with the high-voltage grid will affect the timing and content of CPP's processes, including state implementation.

Although WIRES does not argue that a strong grid is the whole answer to every economic and environmental challenge facing our electricity-dependent society, we contend that the important role of the transmission system in attaining environmental objectives is a key component of the emissions-related solutions that the EPA is pursuing. We encourage the EPA to engage in that pursuit in coordination with FERC, the U.S. Department of Energy, and the President's Council on Environmental Quality ("CEQ") as a matter of interagency coordination and Administration policy. Of utmost importance, however, is the EPA's relationships with the states and its ability to guide how the states formulate emissions reduction plans, especially as they relate to consideration of the benefits and importance of transmission investment. State-by-

---

[4] *Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities*, Order No. 1000, FERC Stats. & Regs. ¶ 31,323, at PP 484 (2011), *order on reh'g*, Order No. 1000-A, 139 FERC ¶ 61,132, *order on reh'g*, 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. Aug. 15, 2014) ("Order No. 1000").

state solutions are not always a good fit for environmental policy making or transmission planning which, like the grid itself, increasingly tends to be an interstate and multi-state phenomenon. This makes thoughtful EPA guidance all the more important. The transmission sector's ability to respond in a coordinated fashion to the complex issues raised by the EPA's proposal will therefore depend on the EPA's ability to utilize or leverage the regional transmission planning processes currently being instituted by FERC under Order No. 1000 to promote infrastructure investment, and its ability to provide greater flexibility in meeting the ultimate carbon reduction goals.

As explained below, WIRES therefore recommends that the EPA –

- Acknowledge the potential impacts that CPP compliance plans will have on electric reliability, including the magnitude of the additional transmission expansion and upgrades that will be necessary for the CPP's success as well as the regulatory obstacles that such infrastructure development will realistically face without more efficient, less duplicative environmental, land use, and other permitting and planning practices;
- Seriously consider developing a Final Rule that recognizes and incorporates the value of significant transmission expansion and upgrades, including an appreciation of the multiple benefits that transmission can provide in accessing more diverse resources, in attaining the kind of optionality that permits achievement of CPP goals under multiple possible scenarios;
- Encourage, and if necessary require, states to consult with transmission owners, regional transmission organizations, and other transmission providers when devising their individual CPP plans or when joining with other states to develop regional and inter-regional plans;
- Reassess the timing of its 'interim' goals and the 'glide path' for complying with carbon reduction standards by 2030 in light of the lead times required to plan, permit, and construct transmission required as part of state compliance plans. Just as the NODA re-examines Building Block 2, the EPA should expand this relief to allow examination of the impact of transmission siting and permitting delays and states' ability to institute regulatory changes under any of the Building Blocks;
- Piggy-back on, or coordinate with, the regional and inter-regional planning processes developing under FERC Order No. 1000, as a way to employ transmission infrastructure to ameliorate constraints, expand the access of resources to markets, and address reliability issues, and to account for the impacts

that their plans will have on domestic and international electricity markets and resources;

- Clarify how credit for carbon reduction, especially as a result of development of renewable resources encouraged by state clean energy policies, will be determined.

II. COMMUNICATIONS

Inquiries about this Comment may be directed to:

James J. Hoecker, WIRES Counsel
Husch Blackwell LLP
Hoecker Energy Law & Policy PLLC
750 Seventeenth Street, N.W.
Suite 900
Washington, D.C. 20006
202-378-2300
james.hoecker@huschblackwell.com

III. BACKGROUND

Section 111 of the Clean Air Act establishes the framework with which the EPA must regulate emissions from certain categories of stationary sources, including new and existing electric generation sources. Section 111(d) requires regulations that establish a procedure for states to submit plans that establish standards of performance for any existing and new sources of emissions.[5] Under the CPP, states must then submit those plans to the EPA for approval; failure to establish an approved plan would necessitate the EPA's direct involvement in establishing a plan. Performance standards must reflect the degree of emissions reduction achievable through the application of the "best system of emission reduction" ("BSER") that the EPA determines has been adequately demonstrated, taking into account the cost of achieving the reduction, any

[5] Under CAA Section 111(d), the EPA will lack authority to adopt standards for existing sources until its standards for new sources are adopted and effective. The status of the EPA's proposed amendments to the New Source Performance Standards for CO_2 (*Carbon Pollution Standards for Modified and Reconstructed Stationary Sources, Electric Utility Generating Units*, 79 Fed Reg. 34960, June 18, 2014) therefore affects the viability of the §111(d) rule for existing sources.

non-air quality health and environmental impacts, and energy requirements. Such standards are typically expressed in pounds of CO_2 per Megawatt-hour (gross) of generation.

The EPA has already entertained comments on a number of specific provisions of its proposed rules and is contemplating changing some timing requirements, as stated in its NODA. We regard this as a positive sign, although the EPA should look at its timelines under the NODA from the perspective of how much transmission has thus far been taken into account. In addition to various timing and measurement issues and the impacts on the operations and performance of different types of electric generation units, WIRES recommends that the EPA resolve broader issues that are clearly at stake, such as the proposed rule's impact on electric system reliability and adequate lead time to construct upgrades needed to support implementation of the forthcoming compliance plans. The EPA's method of building flexibility into the rule is to empower states to use an array of resources and procedures to attain specific goals that were developed state-by-state using a combination of measures from each of four Building Blocks that the EPA believes can "achieve CO_2 emissions reductions of fossil fuel-fired EGUs [electric generation units] such that, when combined with measures from other building blocks, the measures represent the 'best system of emission reduction . . . adequately demonstrated' for fossil fuel-fired EGUs."[6] In short, states can work toward the EPA's goals by improving the heat rates of existing generators, planning re-dispatch of units (principally to natural gas), expanding zero- or low-carbon generation, or increasing demand-side energy efficiency, in any combination.

The magnitude of the impacts of the four proposed "Building Blocks" that states may use will probably vary widely but the assumptions behind them help to clarify what the EPA

[6] 79 Fed Reg. at 34927 and *passim* (quoting CAA Section 111(a), 42 U.S.C. §7411(a)).

anticipates.[7] Blocks 2, 3, and 4 are premised on reducing or eliminating the utilization of fossil fuel fired EGUs, either by substituting generation from certain types of sources or by reducing demand for generation overall. The EPA believes that state-specific goals for 2030 that reflect the agency's calculation of the emissions each state can feasibly achieved through BSER. Plans for achieving interim goals on this 'glide path' toward 2030 reduction targets, including identification of which building blocks will be employed, must be formulated by 2016 and completed not later than 2018. The EPA has also developed interim goals that would need to be met between 2020 and 2029 and final goals beginning in 2030. The interim emissions reduction

---

[7] 79 Fed Reg. 34836 (June 18, 2014). The high level assumptions and considerations can be portrayed as follows:

Building Block	EPA Assumptions	Application Considerations
Heat rate improvement (HRI) to reduce emission rates of coal generating facilities	EPA assumed 6% average savings across the coal fleet: 4% from implementation of best practices and 2% from new equipment.	The potential for improvement will vary by facility.
Fuel switching, or system redispatch from coal to natural gas	EPA assumed that existing combined cycle (CC) capacity across each state could run at an average capacity factor of 70%.	The type and intended application of CC units may impact their maximum capacity factor, as might transmission capability and natural gas availability.
Increasing generation from renewables and preserved generation from nuclear	EPA developed expectations for expanded renewable generation, based on average renewable portfolio standard (RPS) requirements across multi-state regions. EPA assumed that the rule would preserve 6% of existing nuclear generation that would otherwise retire. It also accounted for new nuclear facilities already under construction.	EPA's approach of regional mapping of renewable requirements may result in expectations for generation growth that differ from those of the states themselves. Utilities looking into distributed generation (DG) will need to consider impacts on the distribution network, and the proper forms of compensation/ charges (net energy metering, Value of Solar Tariff, etc.)
Growth in end-use energy efficiency (EE) to displace emitting generation	EPA assumed load savings of up to 1.5% per year, inclusive of existing state EE program requirements.	EE cost and potential will vary by state, and low cost EE projects may have already been implemented.

Source: ICF International Inc.

McCracken, Mihlmeister, Pickles, and Saraf, "EPA's Clean Power Plan: Challenges Ahead for Sources and States," ICF White Paper (October 14, 2014), available at http://icfi.com/insights/white-papers/2014/epa-111d-clean-power-plan-energy-efficiency-impact, accessed Nov. 25, 2014.

goal is 70-80% of the 2030 objective. Given that the interim goal compliance period begins in 2020 and the state plans do not need to be completed until 2017/2018, it will be virtually impossible for any transmission that would be needed – either to support CPP state implementation plans or to keep the lights on – to be planned, permitted, and constructed in time to meet the interim goals.

States and regional transmission organizations ("RTOs") and other regional entities charged with regional transmission planning and coordination across multi-utility markets or across multiple states can also attain the CPP's targeted reductions through activities beyond the Building Blocks. For example, while compliance may be achieved by applying the EPA's "Building Blocks," other actions such as building new natural gas-fired generation can reduce compliance costs. In addition, it is likely that region-wide or RTO-wide approaches to curbing emissions can also reduce costs.[8] In some instances, the most cost-effective means of complying with the EPA's rule may be to retire more coal-based generation than is already projected to retire due to the EPA's Mercury and Air Toxics Standards ("MATS") regulation.[9] An analysis by MISO indicates that the EPA's proposal could put an additional 14 GW of coal capacity at risk of retirement. Clearly, CO_2 regulation could increase coal plant retirements and thereby place substantial new pressure on the grid to ensure reliability. The following

---

8 The Midcontinent Independent System Operator, Inc. ("MISO") estimates that compliance costs within its footprint could be reduced by $3 billion annually (not including the costs of transmission) by a coordinated regional approach. *See* MISO 2014 Carbon Dioxide Analysis at https://www.misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/PAC/2014/20140917/20140917%20PAC%20Item%2002%20MISO%20CO2%20Analysis%20One%20Pager.pdf (Sept. 12, 2014), accessed Nov. 25, 2014.

A MISO study entitled "Manitoba Hydro Wind Synergy Study" determined that new Canadian hydropower can reduce carbon-emitting generation while providing substantial market benefits. https://www.misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/Planning%20Materials/Manitoba%20Hydro%20Wind%20Synergy%20TRG/Manitoba%20Hydro%20Wind%20Synergy%20Study%20Final%20Report.pdf (Oct. 21, 2013), accessed Nov. 25, 2014.

9 40 C.F.R. Parts 60 and 63.

illustrative charts suggest the magnitude of the changes the CPP will create in the U.S. generation fleet:

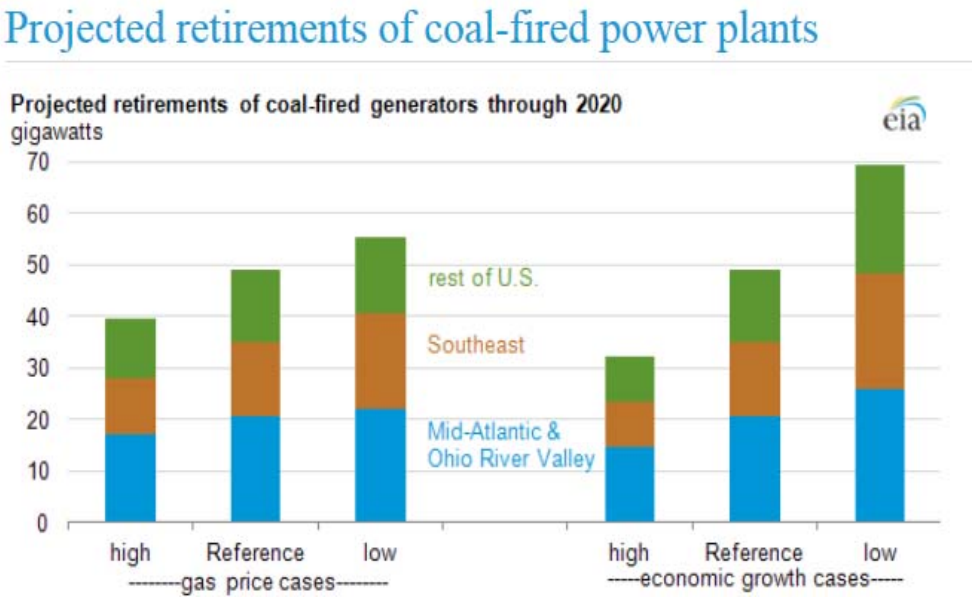

Figure 1. **Source: U.S. Energy Information Administration**[10]

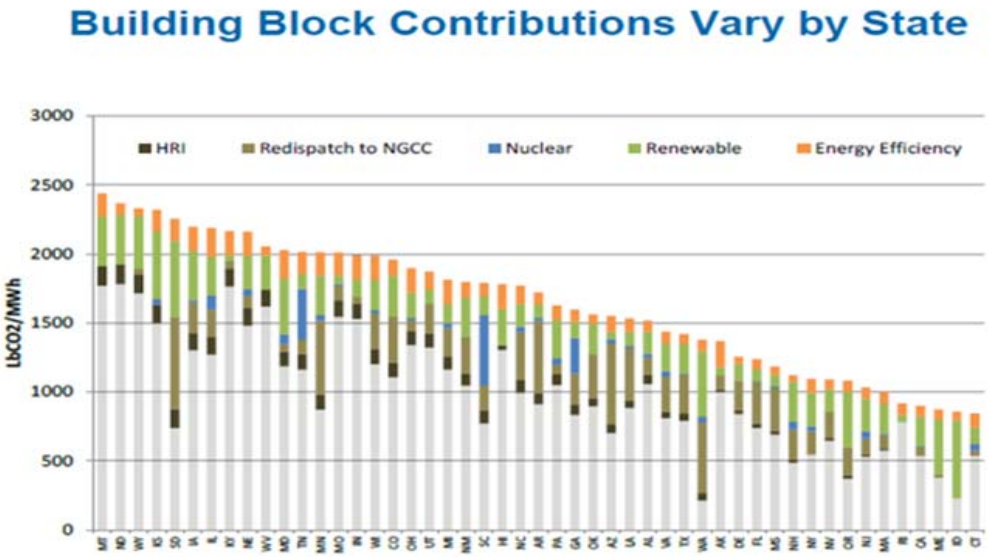

Figure 2. Source: ICF International, Inc.[11]

10 Citing data from U.S. Energy Information Administration, *Annual Energy Outlook 2012 Electric Power Projections by EMM Region*, available at http://www.eia.gov/todayinenergy/detail.cfm?id=7330, accessed Nov. 10, 2014. Even without CPP impacts, the fossil fueled fleet expected retirements.

Finally, WIRES stresses that electric transmission could prove an efficacious means of advancing the Clean Power Plan, especially because transmission can enable greater flexibility and more efficient use of resources across multiple aspects of the electric system, specifically in terms of providing access to lower cost and lower carbon resources as well as supporting emerging technologies and moving bulk power to where it is needed. Transmission can be a significant, if not essential, contributor to the achievement of the EPA's goals if it is part of EPA's calculus.

IV. DISCUSSION

A. The EPA Should Factor In The Potentially Serious Impacts That The CPP Will Have On Electric Reliability And How Electric Transmission Upgrades And Expansion Can Help Address Such Problems.

The EPA has acknowledged that CPP implementation cannot be at the expense of electric reliability. The North American Electric Reliability Corporation ("NERC") has made its concerns known in that regard.[12] WIRES contends that the EPA is under an obligation to ensure that the shift in the industry's generation mix as a result of the CPP does not undermine the reliability of the North American electric system.

As noted above, the CPP calls for access to diverse energy resources including large-scale, location-constrained renewable energy and greater use and re-dispatch of natural gas-based generation. Its success will also depend on deployment of advanced technologies and evolution of competitive bulk power markets, in our estimation. At the same time, the CPP is expected to

---

[11] Citing data from the EPA 'Goal Computation – Appendix 1 and 2.xls' file as processed by ICF. Presented by Chris MacCraken, *Transmission and the Path Forward under EPA's Proposed Clean Power Plan*, presentation to WIRES' Annual Meeting, Oct. 1, 2014.

[12] NERC, *Potential Reliability Impacts of EPA's Proposed Clean Power Plan* (Nov. 2014), available at http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/Potential_Reliability_Impacts_of_EPA_Proposed_CPP_Final.pdf. Also see, NERC, *2014 Long-Term Reliability Assessment* (Nov. 17, 2014), available at http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/2014LTRA_ERATTA.pdf, accessed Nov. 25, 2014.

cause a substantial amount of generation retirements. WIRES urges the EPA to formally require states to include transmission interests in the state implementation planning processes, so that technical and reliability impacts of these changes such as voltage, thermal, and deliverability concerns are adequately considered. As the proposed rulemaking discusses, independent system operators ("ISOs") and regional transmission organizations ("RTOs"), where they exist, will be instrumental in helping develop and model system-wide effects of the state plans.[13] WIRES believes that a regional perspective will be important in a variety of ways. However, inclusion of RTOs and ISOs should not result in exclusion of transmission owners and developers whose knowledge of individual transmission projects and systems and the planning of those projects and systems is comparable. The EPA based its proposed BSER on an appropriate understanding of the "integrated nature of the electric system." It acknowledges, for example, that under Building Block 2, state plans could rely on transmission to re-dispatch natural gas combined cycle units with lower emissions and suggests that, if there are system constraints, transmission planners "have repeatedly demonstrated the ability to . . . relieve bottlenecks and expand capacity."[14] While WIRES counsels against relying too heavily on such assumptions, this statement is an encouraging sign that the EPA recognizes the importance of involving industry expertise in the formulation of state implementation plans. The critical importance of incorporating the views of such experts in the formulation of state or regional plans needs to be clearly expressed in any forthcoming rules.

---

[13] 79 Fed. Reg. at 34899 (June 18, 2014). WIRES supports the recommendation of the ISO/RTO Council that the EPA and the states should provide a "reliability safety valve" procedure so that grid managers can head off specific reliability crises if they were to arise, even if the CPP would otherwise prohibit such action. The Council states that EPA's final CPP "could allow implementation of . . . [the RSV] by incorporating a reliability review conducted by the relevant system operator, working with the states and relevant reliability regulators, prior to finalization and approval of the SIP." ISO/RTO Council, *EPA CO2 Rule – ISO/RTO Council Reliability Safety Valve and Regional Compliance Measurement Proposals* (Jan. 28, 2014) at 2.

[14] *Id.*, at 34864.

B. Transmission Provides Many Benefits That Should Be Seriously Considered And Incorporated As Fundamental To Achieving Emissions Reductions Under the CPP.

WIRES encourages consideration of transmission as a key resource for purposes of meeting emission reduction goals under the CPP. A truly modernized transmission network is the principal lever that enables delivery of generation resources including distributed generation, demand responsiveness, new sources of resilience like storage, micro-grids, and smart technologies, and energy efficiency.[15] Along with these resources, which complement and depend on that grid, comes not only reliability but adaptability. WIRES therefore urges the EPA to focus on transmission infrastructure, for two reasons.

First, as we will explain, transmission provides a range of benefits that, when properly understood and supported, is capable of contributing to the success of the CPP. Thus far, it does not appear to WIRES that the EPA has contemplated what transmission can mean to the CPP or that the delay or insufficiency of new transmission capacity will diminish the possibility of achieving the CPP's goals. While the focal point of the CPP is understandably on shifts in generation resources that are central to a program of emissions reduction as well as on technologies that enhance the efficiency, reliability, and power transfer capabilities of high voltage transmission, the need for additional conventional transmission resources should also be considered in setting the parameters of state implementation of the CPP's Building Blocks.[16] As

---

[15] London Economics International, LLC, *Market Resource Alternatives: An Examination of New Technologies in the Electric Transmission Planning Process*, prepared for WIRES, http://wiresgroup.com/docs/reports/WIRES%20Final%20MRA%20Report_September%202014.pdf (October 2014). The LEI report makes clear that our integrated electric transmission network will be the foundation of our evolving, technology-driven electric system for the foreseeable future.

[16] *See, e.g.*, The Brattle Group, *Transforming America's Power Industry: The Investment Challenge 2010-2030*, prepared for the Edison Foundation (2008); Bipartisan Policy Center Energy & Infrastructure Program, *Policies for a Modern and Reliable U.S. Electric Grid* (February 2013), http://bipartisanpolicy.org/sites/default/files/Energy_Grid_Report.pdf, Center For American Progress, *The Clean Energy Agenda: A Comprehensive Approach to Building the Low-Carbon Economy* (September 2009); Susan F. Tierney, *A 21st Century "Interstate Electric Highway System" -- Connecting Consumers*

WIRES has stressed to the Secretary of Energy in the Quadrennial Energy Review proceeding, the government "should make crystal clear the strategic and economic centrality of electric transmission to an adaptive, resilient, and reliable electricity system."[17] As we discuss below, this may take several forms.

Second, the adequacy and ubiquity of transmission cannot be taken as a given. As WIRES and others have argued strenuously, it cannot be assumed that the major changes to, or utilization of, the generation fleet that the EPA's proposals envision will occur without also making substantial changes and investments in the high-voltage transmission grid.[18] Moreover, to the degree that transmission expansion or upgrades are required, the length of time required to plan and permit these facilities, even before the construction cycle, should be taken into consideration as the EPA and the state create deadlines for meeting emissions targets. The difficulties that transmission faces in federal and state regulatory forums are well-documented.[19] As reflected in this high level flow diagram from the Southwest Power Pool, Inc. ("Southwest Power Pool"), the time typically needed to complete a transmission facility is usually measured in multiple years:

---

and Domestic Clean Power Supplies, Analysis Group (2008); American Society of Civil Engineers, *Failure To Act: The Economic Impact of Current Investment in Electricity Infrastructure* (2012).

17 WIRES letter to Hon. Ernest Moniz, Secretary of Energy, and Hon. John Holdren, Director White House Office of Science and Technology Policy, *Comment of WIRES on the Quadrennial Energy Review*, (Oct. 10, 2014) at p. 2, available at http://www.wiresgroup.com/docs/releases/WIRES%20Letter%20to%20QER%20Oct14.pdf.

18 Advocates for low- and zero-carbon generation are also clear that transmission should be an important element of state implementation plans because [g]eneration and transmission capacity are too tightly interrelated to expect major shifts in the first without concomitant change and expansion in the second, and transmission is more likely that generation to be the critical constraint in terms of timing, siting, permitting, and need for positive government action. Draft Comments of Americans For A Clean Energy Grid, at 2.

19 S*ee also Federal Energy Regulatory Commission*, Policy Statement on Promoting Transmission Investment Though Pricing Reform, 141 FERC ¶ 61,129 (Nov. 15, 2012); U.S. Department of Energy (National Renewable Energy Laboratory), *20% Wind By 2030: Increasing Wind Energy's Contribution to U.S. Electric Supply*, DOE/GO-102008-2567, July 2008; Americans for a Clean Energy Grid, *The Net Benefits of Increased Wind Power in PJM*, May 9, 2013, available at http://cleanenergytransmission.org/uploads/EFC%20PJM%20Final%20Report%20May%209%202013.pdf.

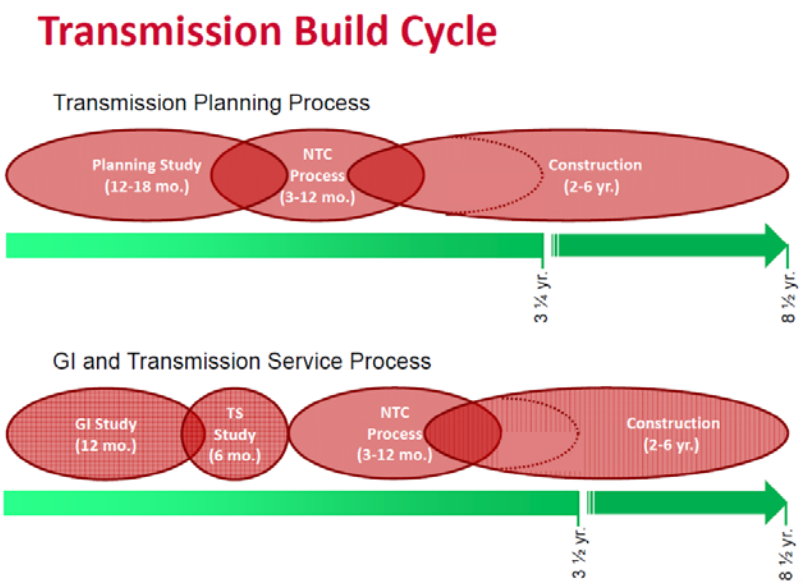

Figure 3. Source: Southwest Power Pool

The time typically needed to bring projects, including those that are driven by public policies like state renewable portfolio standard ("RPSs"), from concept to energization, can be five to ten years and substantially more in many cases. Smaller, more discrete projects take less time to develop than larger or multi-state projects, as a rule. There is remarkable uncertainty about the future of many proposed projects. The length of the planning and permitting processes will have an impact on the ability of many states and regions to set and accomplish reasonable emission reduction goals, especially under building Blocks 2 and 3 of the CPP, within a predictable timeframe. It casts immediate doubt on the practicality of the interim goals.

Far from simply connecting Point A to Point B, the transmission network provides an extensive portfolio of benefits, including the ability to leverage and aggregate new investments in advanced technologies – distributed generation, storage, micro-grids, energy efficiency and more – for the benefit of broader evolving markets. Citing the most important study on the benefits of new transmission capacity,[20] WIRES argues that, not only will a robust grid deliver

[20] The Brattle Group [Chang, Pfeifenberger, and Hagerty], *The Benefits of Electric Transmission: Identifying and Analyzing the Value of Investments*, prepared for WIRES (July 2013). "Despite the differences among

the low- or zero-carbon resources upon which one of the CPP's building blocks depend, transmission investment adds a flexibility and adaptability to the entire bulk power system that will smooth the transition to the new resource mix that the CPP promotes.

In explaining how the benefits of transmission benefits can be elucidated in the typical utility or regional planning process, the Brattle Group study also suggests that many of those benefits will accrue to any system under the stresses of change. As the comments that EPA has already received make clear, the benefits of transmission will be very important to addressing the challenges and cost impacts the CPP might otherwise create. WIRES, therefore, provides as an Appendix A to this Comment, a "checklist" of the many benefits of transmission from The Brattle Group study.[21]

These benefits could add meaningfully to the CPP's BSER by offering substantial production cost savings from potential efficiencies and market competition as well as direct environmental gains and support for public policies favoring cleaner energy production. Because the EPA inexplicably overlooks these benefits, we identify a few from the Brattle Group study:

Reliability. **"**Transmission investments will generally increase the reliability of the electric power system even when meeting reliability standards is not the primary purpose of the line. For example, additional transmission investment made for market efficiency and public policy goals can avoid or defer reliability upgrades that would otherwise be necessary, increase operating

---

regions in how they consider transmission benefits in planning, the same set of potential transmission benefits applies regardless of the specific market or geographic location. The magnitudes of benefits associated with transmission investments depend on the market conditions and the physics of electric power flows, and not on the regulatory framework under which the investments are made." *Id.*, at iii. Appendix A from this Brattle report is attached.

[21] The checklist in Appendix A was created as a handy reference for policymakers and planners. As the EPA considers the long-term solutions that address its findings, the benefits of long-term infrastructure investments will become more important and compelling. WIRES recommends that the EPA consult the Brattle Group report for an understanding of the dynamic impacts of transmission.

flexibility, reduce the risk of load shed events, and increase options for recovering from supply disruptions. This increase in reliability provides economic value by reducing the frequency, duration, and magnitude of load curtailments – or, alternatively, by reducing the planning reserve margins needed to maintain resource adequacy targets, such as a 1-day-in-10-year loss of load probability."[22]

Market benefits. "[T]he production cost and market price benefits associated with transmission investments could exceed the benefits quantified in cost-based simulations. This will be particularly true for transmission projects that expand access to broader geographic markets and allow more suppliers than otherwise to compete in the regional power market. Such effects are most pronounced during tight market conditions. Specifically, enlarging the market by transmission lines that increase transfer capability across multiple markets can decrease suppliers' market power and reduce overall market concentration."[23]

Environmental benefits. **"**Depending on the effects of transmission expansions on the overall generation dispatch, some can reduce harmful emissions (*e.g.*, SO2, NO2, particulates, mercury, and greenhouse gases) by avoiding the dispatch of high-emission generation resources. The benefits of reduced emissions with a market pricing mechanism are largely calculated in production cost simulations for pollutants with emission prices such as SO2 and NO2. . . . As more and more transmission projects are proposed to interconnect and better aggregate renewable resources, some project proponents have quantified specific emissions reductions associated with those projects."[24]

---

22 *Id.*, at 46-47.

23 *Id.*, at 52.

24 *Id.*, at 54.

Public policy benefits. **"**Some transmission projects can help regions reduce the cost of reaching public-policy goals, such as meeting the region's renewable energy targets by facilitating the integration of lower-cost renewable resources located in remote areas; while enlarging markets by interconnecting regions can also decrease a region's cost of balancing intermittent resources. . . . Additional transmission investment can also help reduce the cost associated with balancing intermittent resources. . . . [E]ven though making significant transmission investments to gain access to remotely-located renewable resources seems to increase the cost of delivering renewable generation, the savings associated with reducing the renewable generation costs (by access to high quality renewable resources), reducing the system balancing costs, and achieving other reliability and economic benefits can exceed the incremental cost of those transmission projects."[25]

Optionality. Modernization of the grid depends on the adequacy and ubiquity of the interconnections between generation and load, that only transmission infrastructure can provide. No one can predict precisely how the North American electric system will be operated a generation or two from now because ours is a uniquely transformative era in this critical industry and there are multiple possible scenarios for change. Those changes will be driven variously by low carbon electric generation, the abundance of domestic natural gas, threats to the reliability of the system and the quality of power, emerging institutions and processes (many promoted by FERC, the Department of Energy, or even the EPA), public policy choices at the state and federal levels, new technologies, and market realities that foster new ways to buy and sell electricity. "The industry faces considerable uncertainties on both a near- and long-term basis that should be considered in transmission planning. The consideration of near-term uncertainties

[25] *Id.*, at 54-56.

– such as uncertainties in loads, volatility in fuel prices, and transmission and generation outages – is important because the value of the transmission infrastructure general is disproportionately concentrated in periods of more challenging, or possibly extreme, market conditions. . . . Paying attention to how benefits and costs accrue over time across future scenarios will also help planners to optimize the timing of transmission investments from a long-term value perspective."[26] A robust transmission system is a hedge against a variety of uncertainties, including those that the CPP tends to create.

Under most any conceivable scenario, two factors will still apply, however. First and perhaps foremost, consumers will be entitled to the best electric service at the lowest reasonable cost. But second, transmission – if properly planned to be efficient, reliable, and resilient – will provide the kind of optionality and flexibility that will be essential to having the best service at reasonable cost over time. Transmission infrastructure is just part of the answer to the economic or environmental challenges facing this electricity-dependent society. However, a strong grid is an essential component of a broader solution to the carbon intensity of the electric power business. WIRES is concerned that the EPA may underestimate its importance as a contributing factor to achievement of the CPP's goals. If transmission is not considered in the development of state implementation plans, the EPA would be limiting the options available for achieving compliance with its emissions targets.

Overall, the transmission grid we have today is not the grid we will need, especially to meet the goals of the CPP in a cost-effective manner. A more robust transmission system will equip the North American electricity marketplace to address a range of possible scenarios as the

---

[26] *Id*., at 65. *See* also Eastern Interconnection States' Planning Council, *Co-optimization of Transmission and Other Supply Resources* (Sept. 2013). Also, SNL Financial (Dec. 13, 2013), *Planning Generation, Transmission Simultaneously Could Save Billions*, reports say: "A group of academic experts found that planning generation and transmission investments simultaneously could reduce the collective costs of long-term plans by billions of dollars."

system evolves under multiple economic and regulatory demands. WIRES is asking the EPA – which will have a powerful impact on that system under the CPP – to participate in preparing the electric system for the coming more highly integrated, efficient, technology-driven future that it clearly anticipates.

C. The EPA Should Recognize The Critical Importance Of Transmission Expansion And Upgrades To Low Carbon And Zero Carbon Generation.

Transmission is of central importance to the success of the CPP as the critical link between all fuel resources and electricity customers in the North American power market. Base load fossil fueled units, nuclear plants, a new natural gas combined cycle generation, and central station solar and wind as well as hydroelectric generation will depend on market access to be economically viable. As renewable energy technologies have become more cost competitive and efficient, the primary obstacle to its further deployment in areas having the highest quality wind and solar resources remains the lack of adequate transmission capable of moving green energy to distant markets.[27] This factor is fundamental to the feasibility of Building Block 3 of the EPA's proposed rule. To ensure that the role of transmission is considered, transmission owners and providers, as well as RTOs and ISOs, should be afforded the opportunity to furnish technical information in support of transmission solutions capable of increasing the efficiency of the system as a whole, while also achieving emissions reduction goals. As FERC recognized in establishing its Order No. 1000 planning processes, transmission is a regional and even inter-regional phenomenon that requires a broad planning perspective and a determination to coordinate state law and regulation as never before.

The path to developing transmission is not often a straight or expeditious one. On one

[27] *See, e.g.*, Order No. 1000 at ¶ 484 "[T]he expansion of regional power markets has led to a growing need for new transmission facilities that cross several utility, RTO, ISO or other regions. Similarly, the increasing adoption of state resource policies, such as renewable portfolio standards, has contributed to the rapid growth of renewable energy resources that are frequently remote from load centers."

hand, transmission has played an important role in facilitating timely renewable energy development, as amply demonstrated by the Texas experience with Competitive Renewable Energy Zone ("CREZ"), the regional transmission expansion plans (*i.e*., Priority Projects) in the Southwest Power Pool, and the regional benefits associated with the Multi-Value Projects in MISO. On the other hand, transmission planning and development is growing more complex and often more difficult (*e.g.,* differing state and federal facilities siting regimes, conflicting cost allocation theories and proposals, and multiple layers of environmental reviews under both state and federal law), as evidenced by lengthy regulatory approval processes and construction periods, even when important reliability needs or the requirements of public policy like lower carbon generation are at stake. Notwithstanding these challenges, EPA should reject the urge to discount the importance of transmission to fulfilling its goals. Nor should it assume that the industry will always find it easy to avoid or diminish congestion, build new infrastructure to compensate for a lack of market access, or address reliability challenges. If the need for transmission is not articulated in the state plans, a coordinated approach to addressing these challenges becomes all the more difficult.

In sum, the EPA simply must help ensure that transmission is part of its strategic approach as it facilitates the very fundamental changes in the way electric generation is planned, fueled, and dispatched. The EPA can do so by emphasizing to the states the importance of considering transmission options as they consider how to work within or outside the Building Blocks to develop implementation plans. To do this efficiently states need to involve transmission owners and providers and RTOs and ISOs, where they exist, in the conversation. Because transmission siting is largely subject to the jurisdiction and varying requirements of individual states, states have the ability to work with each other and with transmission planners

and agencies having responsibility to protect land and other resources, to make the permitting process, including environmental reviews, less duplicative and inefficient.

Furthermore, planning for the transmission required as part of compliance with the CPP, especially to connect new renewable energy resources, will require a high degree of certainty in how renewable energy developers and stakeholders will be treated in receiving credit for these generation investments. WIRES encourage the EPA to clarify the accounting of interstate renewable energy trading and emissions reductions. States, renewable energy producers and purchasers, and transmission developers alike need clear guidance on accounting of renewable energy purchases and associated emissions reductions. As the EPA notes in the proposed rule and Technical Support Document ("TSD") on State Plan Considerations, a significant amount of interstate trading of energy and RECs occurs today and will continue. Yet many stakeholders are uncertain if renewable generation imported from other states or Canada can count toward 111(d) compliance. To ensure that renewable energy and transmission development continue to occur expeditiously and cost effectively in support of measures available under Building Block 3 clear accounting rules to award credit to the appropriate parties for emissions reductions associated with renewable energy should be established.[28] WIRES supports the following approach proposed by EPA in the draft rule:

---

[28] As the TSD explains, "State RPS regulations also impact electricity generation at a regional level. Over time, state RPSs result in the introduction of new, incremental renewable energy generating capacity to regional generation control areas, which affects EGU dispatch at the regional level... Many state RPSs do not require the qualifying renewable energy electric generation to take place within the state, or even be delivered into the state, but instead require that the renewable energy be *supplied within (or delivered into) the ISO/RTO in which the state resides* (emphasis added). Often, utility compliance with state RPS is through the submission of renewable energy credits (RECs), which represent the attributes of renewable energy generation but not the actual electricity generated. As a result, in many cases the intent of the state policy is often to affect the characteristics of the regional electric generation mix, rather than the state generation mix." EPA, *Technical Support Document for Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units* ("TSD"), EPA-HQ-OAR-2013-0602 State Plan Considerations, http://www2.epa.gov/sites/production/files/2014-06/documents/20140602tsd-state-plan-considerations.pdf.

> The EPA is proposing that, for renewable energy measures, consistent with existing state RPS policies, a state could take into account all of the CO_2 emission reductions from renewable energy measures implemented by the state, whether they occur in the state or in other states. This proposed approach for RE acknowledges the existence of renewable energy certificates ("REC") that allow for interstate trading of RE attributes and the fact that a given state's RPS requirements often allow for the use of qualifying RE located in another state to be used to comply with that state's RPS.[29]

Several states that do not have abundant renewable resources within their borders do not have an RPS mandate and may be unlikely to pass such legislation. However, wind energy imported via new and existing transmission lines will be an important option to consider for cost-effective attainment of CPP goals, both in states with a mandatory RPS and those that may have one in the future. Many utilities buy renewable energy from other states purely on the basis of cost, and without the requirement of a state RPS. For example, Arkansas utilities buy wind energy primarily from Oklahoma and Kansas, leveraging the transmission system to cost-effectively serve consumers. In such states without RPS mandates, utilities that execute power purchase agreements ("PPAs") with or build and own renewable energy generation should still get credit for resulting emissions reductions, regardless of where they occur, as long as the renewable energy is delivered to the appropriate regional transmission network and the utility commits to quantify, measure and verify energy purchased or generated. RECs can be utilized for tracking and can help prevent double counting of renewable energy generation, even in states without a mandatory RPS. WIRES further suggests EPA should clearly credit renewable generation based upon out-of-state PPAs in a manner that does not require importing states to negotiate agreements with exporting states.

---

[29] EPA 2014c. *Carbon pollution emission guidelines for existing stationary sources: Electric utility generating units*. Section 6: Treatment of Interstate effects under F. State Plan Considerations, available at https://www.federalregister.gov/articles/2014/06/18/2014-13726/carbon-pollution-emission-guidelines-for-existing-stationary-sources-electric-utility-generating, accessed November 7, 2014.

D. Regional Planning And Cost Allocation Under FERC's Order No. 1000 Cannot Practically Be Divorced From State Plans Under The CPP.

Noting that some regions like the Northeast have successfully integrated state and regional environmental requirements into wholesale market operations and design (*e.g.*, the Regional Greenhouse Gas Initiative, or "RGGI"), FERC Chairman LaFleur stated that it remains to be seen whether individual state implementation plans under the CPP might conflict with the transmission plans or electricity market dispatch rules of individual regional transmission organizations ("RTOs"), which are typically formulated on a regional, not state, level.[30] The Chairman acknowledged that "the Clean Power Plan… and related state compliance plans could have implications for the operation of the grid." She rightly points out that the EPA and the states must coordinate with FERC, which may be required to "consider whether changes to rate structures and market rules will be needed to support reliable implementation of the state compliance plans."[31]

WIRES shares the Chairman's view that fundamental changes may be afoot that could alter power market operations and therefore the planning and development of transmission and other energy infrastructure. The layers of complication and process are manifest. For example, the MATS rule applies to individual generating plants and institutes specific limits on emissions for each power plant; the CPP directs each state to devise a special CPP compliance plan for that state's specific emissions reduction goals using the Building Blocks as necessary; and meanwhile FERC is asking RTOs and other regional entities to formulate processes and policies that will govern the planning, construction, operation, and cost recovery of the transmission network

---

[30] Testimony of Acting Chairman Cheryl A. LaFleur To Committee on Energy & Commerce, Subcommittee on Energy & Power, [U.S. House of Representatives], (July 29, 2014) and Response to Preliminary Questions, *passim*. New York, California, and the ERCOT portion of Texas are exceptions but they are relatively large markets by themselves.

[31] *Id.* at 4.

across utility, state, and regional boundaries. WIRES is confident that the federal agencies intend to coordinate the implementation of these diverse initiatives to the extent practicable but the task is huge. We therefore recommend that pains be taken to ensure that the interest of regional markets and the development of the high voltage transmission system, which embodies interstate commerce, are represented as the states devise their CPP compliance plans.

Implementation of FERC's Order No. 1000 is now over three years along.[32] It has afforded public utilities and regional entities like RTOs considerable flexibility when it comes to planning future transmission expansion (including alternatives to transmission), deciding who will pay for those facilities, and deciding how competition for regional cost-based projects will work. At a minimum, the EPA should leverage existing planning resources and studies such as the Eastern Interconnection Planning Collaborative, for information and analyses that states can (and should) utilize in making CPP compliance plans reasonable from an electric reliability as well as an emissions reduction point of view. WIRES is certain that the value of transmission will become evident to EPA under those circumstances.

E. The EPA Must Ensure That State Planning Processes Are Open To Inclusion Of Transmission Owners and Providers And To Consideration Of Transmission-based Strategies For Compliance.

As mentioned above, WIRES strongly contends that transmission owners and providers can play an important role in developing cost-effective and efficient state plans as they relate to consideration of transmission. The transmission sector should be involved in the compliance process because identifying the transmission expansion options necessary for dispatching more natural gas-fired generation (i.e., Building Block 2) and interconnecting and more efficiently accessing renewable resources (i.e., Building Block 3) are central to the CPP. The state and

[32] Order No. 1000, *supra* note 4.

regional resources currently being dedicated to implementation of Order No. 1000, including and especially the knowledgeable RTO planners and their member and state committees (*e.g.*, the Organization of MISO States or the Southwest Power Pool's Regional State Committee) can be instrumental in accelerating the formulation of state plans and in ensuring that the key transmission sector is included as a likely participant in reducing emission under three of the four Building Blocks.

The EPA's proposed CPP states that demand-side energy efficiency under Building Block 4 "would reduce the amount of electricity that would need to be delivered over the electric grid, generally reducing pressure of the grid and thereby improving electricity system reliability."[33] While we agree that energy efficiency will be an important part of managing our resources, promoting cleaner energy production, and reducing emissions in the 21st century, the EPA unwisely subscribes to the notion that stable or even declining demand for electricity translates in to a proportionately reduced need for energy delivery infrastructure. Experience has proven this to be an indefensible assumption. Investment in transmission has in fact begun to recover in the recent recessionary period, notwithstanding anemic demand for electric power. The transmission system is actually in the process of being replaced and upgraded with new technologies because newly competitive power markets require more reliable transfer capacity, situational awareness, and higher quality power (*i.e.*, fewer interruptions). Perhaps most important, the significant increase in location-constrained renewable energy resources that the EPA itself aims to promote frequently has no physical or economic access to markets.[34]

On a related point, the EPA identifies transmission "efficiency improvements" as a

---

[33] 79 Fed. Reg. 34885 (June 18, 2014).

[34] *See, e.g.*, Gene Wolf, "New Renewables Will Require Transmission Upgrades," T&D World Magazine, http://tdworld.com/renewables/new-renewables-will-require-transmission-upgrades.

measure that could be used to reduce CO_2 emissions that was not specifically included in one of the Building Blocks.[35] WIRES believes that transmission delivers efficiency at a different level than that which the EPA contemplates in Building Block 4. WIRES points to the discussion of Building Block 4, where the EPA states: "Another way to reduce the utilization of, and CO_2 emissions from, affected EGUs is through electricity transmission and distribution upgrades that reduce electricity losses during the delivery of electricity to end users. Just as end-use energy efficiency can reduce mass emissions from affected EGUs, so can transmission upgrades."[36] This hints at but does not entirely capture the macro-efficiencies that transmission can bring to regional markets in terms of cleaner generation or the option not to build generation at all. We ask the EPA to more fully examine the efficiency potential of a strengthened transmission system.

In sum, the benefits of transmission are aligned with the EPA's goals, although it has only mentioned those possible benefits in passing. WIRES argues that these are necessary and sufficient reasons for transmission providers and RTOs or ISOs to be involved in developing compliance plans to identify upgrades and expansions and increase the efficiency of both the transmission system and the electric system overall and to improve methods for measuring and validating those efficiency gains. All of the benefits of transmission should be considered in developing states' compliance plans. Indeed, the CPP's goals cannot be met without upgraded and expanded transmission facilities. The EPA should allow state compliance plans to realistically reflect the significant amount of time and resources, described elsewhere in these comments, that will be required to plan, site, permit, and bring these facilities into service in the interstate, bulk power markets. Along with the ability to access natural gas-fired and zero-

[35] 79 Fed. Reg. 34923 (June 18, 2014).

[36] *Id.* at 34924.

emission generation, other benefits of new and upgraded transmission, such as reduced losses, should be taken into consideration in developing plans to meet states' emission rate goals.

F. WIRES Asks That The EPA Ensure That Economic Regulatory Agencies, State Energy Offices, And State Chief Executives Be Consulted During Formulation of State Implementation Plans.

The retirement of some heavily relied-upon generation, greater use of existing natural gas-fired plants for intermediate and based load operation (Building Block 2), the development of new natural gas-fired generation, the advent of new flow patterns, and development of zero-carbon generation (Building Block 3) will lead to very basic and long-lived changes in the system, initially complicating its operation and planning but perhaps improving these in the long term. Yet, the EPA proposal cedes development of the state implementation plans to environmental agencies, including state air offices. WIRES hastens to point out that it is the economic regulatory agencies, the state energy offices, and other state officials that focus on the reliability and economic development issues that will be the outcome of the CPP. We believe the EPA has an important stake in ensuring that state plans are founded on an understanding of the technical requirements of the grid and not (at least entirely) on the resource preferences and utility cultures of individual states. The end product of an integrated approach that embraces the EPA's CPP, FERC's Order No. 1000, and the programs of state policy makers (including RPSs) can be a superior and more efficient approach to achieving the EPA's goals if EPA ensures reliability and economic regulatory expertise is enlisted in the effort.

For that elemental reason, WIRES urges the EPA to formally include transmission interests in the state processes of developing compliance plans as well, so that technical and reliability impacts such as voltage, thermal and deliverability concerns are adequately considered. The proposed CPP discusses ISOs and RTOs as involved in helping develop and

modeling system-wide effects of the state plans.[37] WIRES believe the involvement of these important regional grid managers should not be to the exclusion of transmission owners and developers whose knowledge of individual transmission systems and planning cost-effective and efficient facilities is at least comparable. As we noted above, the EPA bases its proposed BSER in the form of the Building Blocks that support state emission reduction goals on an understanding of "the integrated nature of the electricity system." WIRES believes that that acknowledgement alone supports its contention that consideration of the transmission network is an important if not critical component of the CPP.

G. Watchwords For EPA – Timeliness And Flexibility: Given The Complexity Of This Proceeding And The Challenges Facing New Infrastructure, The EPA Should Provide As Much Flexibility As Possible.

The proposed CPP does not adequately provide for planned integration of generation and transmission resources to meet the substantial CO_2 reductions targets suggested by the EPA. First, it is necessary to understand that existing transmission and generation infrastructures are symbiotic; that is, the current state of the transmission grid originated in the planned utilization of the generation resources installed incrementally over the last 40 to 50 years to meet the domestic loads of integrated utilities. As we argue above, the retirement of base-load resources and the prospect of their replacement by the re-dispatch of intermediate-duty generating facilities, so that they would then fulfill the base-load function, will require several substantial natural gas pipeline and electric transmission infrastructure additions and improvements crossing the entire country. The CPP proposes to undertake this reinvention of a considerable part of the generation fleet and related transmission facilities on an unprecedented timeline.

[37] *Id.* at 34899.

To lend some perspective, the overlay of the first major 765-kV bulk transmission system in the U.S. was constructed over the top of a mostly existing 138, 345 and 500-kV interconnected transmission system and large central station base-load power plants. The first transmission line segment began operating in 1969.[38] Planning however for such a system commenced in 1964 and the largest components of the 765-kV system (AC) took a quarter century to complete. While extraordinary, this kind of network backbone can only be replicated today through the incremental planning, authorization, and construction of several more discrete transmission projects. It is hard to appreciate the time and expense required to accomplish such infrastructure additions under current regulatory conditions.

Consequently, WIRES also requests that EPA utilize its relationships within the Administration and with independent agencies to seek to rationalize and streamline project review under the National Environmental Policy Act of 1969 which, when duplicative, can consume significant amounts of time and expense. WIRES suggests that, once a state implementation plan has been approved, the environmental reviews and related infrastructure permitting procedures needed to implement the plans should be combined and accelerated. We recognize that the President's Council on Environmental Quality has the ability to encourage such changes, which seem to WIRES to be appropriate in pursuit of CO2 reductions. Given our Members' experience in planning and constructing transmission, including regional lines to facilitate public policy such as renewable portfolio standards, WIRES urges the EPA to reevaluate whether the CPP allots time in its compliance processes sufficient for development of the large-scale transmission that Building Blocks 2 and 3 necessitates. For example, the "Multi-Value Projects" in MISO were approved for inclusion in the RTO's regional transmission

[38] American Electric Power, *Transmission Firsts*, available at http://www.aep.com/about/transmission/TransmissionFirsts.aspx, accessed Nov. 25, 2014.

expansion plan in 2010 and 2011. While some of the smaller projects have been constructed and are in service, the larger projects are either still making their way through state regulatory processes or are being constructed, with some not expected to be in service until 2019. Furthermore, the transmission planning process is an iterative one that is based upon several successive and therefore incremental additions to the integrated generation and transmission systems. It is very unlikely that a single 10-year plan can ever be executed upon to serve what is now only a sequence of imagined generation solutions.

Under the proposed CPP, states will be required to meet interim emission rate goals between 2020 and 2029 and final goals by 2030. Compliance plans must be submitted to the EPA between 2016 and 2018, depending on the proposal. Recognizing that there is no time to waste if CO_2 reductions are to meet the EPA's target by 2030, WIRES nevertheless urges the EPA to be flexible in setting interim deadlines on the 'glide path' to compliance, particularly when transmission development is critical to the state plan's accomplishment. The time and up-front expense it will take transmission owners and developers to adequately develop and vet the projects in local and regional planning processes, obtain the necessary state and federal permits, and construct the needed transmission facilities can often exceed that of any other energy infrastructure. Planning, obtaining necessary stakeholder feedback, gaining regulatory approval, constructing, and placing into service the necessary transmission facilities is a long lead-time process. This problem is exacerbated by the multiplicity of state and federal regulatory agencies that are invariably involved in deciding whether a project is in the public interest in terms of its engineering, aesthetic impacts, effect on protected resources, the financial capabilities of its sponsor, its benefits compared to those of competitors, ability to provide reliability, economic, or public policy benefits, and the extent to which it impacts federal lands or more than one state – a

common phenomenon for this interstate network.[39] Needless to say, transmission owners and providers that ultimately aim to provide transmission facilities under a state or regional plan should be consulted about the obstacles standing in the way of transmission additions that will interconnect the shifting generation fleet with loads, the efficiencies they can produce, and the other benefits a stronger grid will provide.

V. CONCLUSION

To recap, WIRES believes the EPA should be persuaded to amend its approach in some ways. It argues that EPA risks a failed emissions policy, and at great cost to the industry and to customers, if it does not ensure that transmission's capabilities and strategic value to the CPP are adequately considered in state implementation plans. The EPA's proposal fails to treat transmission as a means to attaining compliance, specifically as (1) a component of the measures outlined in Building Blocks 2, 3, and 4; (2) a means of creating a cleaner, more efficient electric system overall; and (3) a tool that will assist and smooth the transition to a fundamentally changed bulk power market. Moreover, the CPP does not outline an outreach plan that ensures that the stakeholders and agencies, both state and federal, most knowledgeable about transmission are involved in developing emission reduction strategies that will both achieve the EPA's goals and preserve the reliable operations of the system.

At bottom, the transition that the electric system is undergoing and that the CPP accelerates will not be manageable without attention to the central importance of the grid in supporting and integrating a variety of outcomes under the Building Blocks, as they are

[39] James J. Hoecker and Douglas W. Smith, "Regulatory Federalism and Development of Electric Transmission: A Brewing Strom?" *Energy Law Journal*, Vol. 35, No. 1 (2014). Our system of federalism, a boon in so many ways can be an obstacle to interstate infrastructure enhancements. Similarly, satisfying the obligations under the Clean Air Act is a joint federal-state obligation. This is nowhere more difficult than when initiating a rulemaking under CAA § 111(d), which has been used infrequently nation-wide and only once attempted in the energy sector (the original Clean Air Mercury Rule (CAMR) during the Bush Administration).

developed in all states and regions and between regions. WIRES stands ready to assist the EPA manage the difficult task it has mapped out for itself of moving toward a lower carbon future that also respects the reliability and economic efficiency of the electric power system.

Respectfully submitted,

Phillip C. Grigsby,
President of WIRES
Vice President, Commercial Transmission
Duke Energy
Charlotte, North Carolina

James J. Hoecker
WIRES Counsel
Husch Blackwell LLP
Hoecker Energy Law & Policy
Washington, D.C.

Cc: Hon. Mary Landrieu, Chair,
Committee on Energy and Natural Resources, U.S. Senate
Hon. Lisa Murkowski, Ranking Member
Committee on Energy and Natural Resources, U.S. Senate
Hon. Fred Upton, Chairman
Committee on Energy & Commerce, U.S. House of Representatives
Hon. Ed Whitfield, Chairman, Subcommittee on Energy and Power,
Committee on Energy & Commerce, U.S. House of Representatives
Hon. Ernest Moniz, Secretary, U.S. Department of Energy

Chairman and Commissioners, Federal Energy Regulatory Commission

Attachment as Appendix A: The Brattle Group, "The Benefits of Electric Transmission: Identifying and Analyzing the Value of Investments", Appendix A (June 2013)

APPENDIX A:

CHECKLIST OF ECONOMIC BENEFITS OF TRANSMISSION PROJECTS

Summary Table of Economic Benefits	
Benefit Category	**Transmission Benefit**
1. Traditional Production Cost Savings	Production cost savings as traditionally estimated, including impact of planned and forced generation outages
1a-1i. Additional Production Cost Savings	a. Reduced transmission energy losses
	b. Reduced congestion due to transmission outages
	c. Mitigation of extreme events and system contingencies
	d. Mitigation of weather and load uncertainty
	e. Reduced cost due to imperfect foresight of real-time system conditions
	f. Reduced cost of cycling power plants
	g. Reduced amounts and costs of operating reserves and other ancillary services
	h. Mitigation of reliability-must-run (RMR) conditions
	i. More realistic representation of system utilization in "Day-1" markets
2. Reliability and Resource Adequacy Benefits	a. Avoided/deferred reliability projects
	b. Reduced loss of load probability or c. Reduced planning reserve margin
3. Generation Capacity Cost Savings	a. Capacity cost benefits from reduced peak energy losses
	b. Deferred generation capacity investments
	c. Access to lower-cost generation resources
4. Market Benefits	a. Increased competition
	b. Increased market liquidity
5. Environmental Benefits	a. Reduced emissions of air pollutants
	b. Improved utilization of transmission corridors
6. Public Policy Benefits	Reduced cost of meeting public policy goals
7. Employment and Economic Development Benefits	Increased employment and economic activity; Increased tax revenues
8. Other Project-Specific Benefits	Examples: storm hardening, increased load serving capability, synergies with future transmission projects, increased fuel diversity and resource planning flexibility, increased wheeling revenues, increased transmission rights and customer congestion-hedging value, and HVDC operational benefits

1. Additional Production Cost Savings				
	Transmission Benefit	**Benefit Description**	**Approach to Estimating Benefit**	**Examples**
1. Additional Production Cost Savings				
--	Reduced impact of forced generation outages	Consideration of both planned and forced generation outages will increase impact	Consider both planned and (at least one draw of) forced outages in market simulations.	Already considered in most (but not all) RTOs
a.	Reduced transmission energy losses	Reduced energy losses incurred in transmittal of power from generation to loads reduces production costs	Either (1) simulate losses in production cost models; (2) estimate changes in losses with power flow models for range of hours; or (3) estimate how cost of supplying losses will likely change with marginal loss charges	CAISO (PVD2) ATC Paddock-Rockdale SPP (RCAR)
b.	Reduced congestion due to transmission outages	Reduced production costs during transmission outages that significantly increase transmission congestion	Introduce data set of normalized outage schedule (not including extreme events) into simulations or reduce limits of constraints that make constraints bind more frequently	SPP (RCAR) RITELine
c.	Mitigation of extreme events and system contingencies	Reduced production costs during extreme events, such as unusual weather conditions, fuel shortages, or multiple outages.	Calculate the probability-weighed production cost benefits through production cost simulation for a set of extreme historical market conditions	CAISO (PVD2) ATC Paddock-Rockdale
d.	Mitigation of weather and load uncertainty	Reduced production costs during higher than normal load conditions or significant shifts in regional weather patterns	Use SPP suggested modeling of 90/10 and 10/90 load conditions as well as scenarios reflecting common regional weather patterns	SPP (RCAR)
e.	Reduced costs due to imperfect foresight of real-time conditions	Reduced production costs during deviations from forecasted load conditions, intermittent resource generation, or plant outages	Simulate one set of anticipated load and generation conditions for commitment (e.g., day ahead) and another set of load and generation conditions during real-time based on historical data	
f.	Reduced cost of cycling power plants	Reduced production costs due to reduction in costly cycling of power plants	Further develop and test production cost simulation to fully quantify this potential benefit ; include long-term impact on maintenance costs	WECC study
g.	Reduced amounts and costs of ancillary services	Reduced production costs for required level of operating reserves	Analyze quantity and type of ancillary services needed with and without the contemplated transmission investments	NTTG WestConnect MISO MVP
h.	Mitigation RMR conditions	Reduced dispatch of high-cost RMR generators	Changes in RMR determined with external model used as input to production cost simulations	ITC-Entergy CAISO (PVD2)
i.	More realistic representation of system utilization in "Day-1" markets	Transmission offers higher benefits if market design is utilizing the existing grid less efficiently	Use flowgate derates (in addition to the traditional use of hurdle rates between balancing areas) in production cost simulations to more realistically approximate system utilization in "Day-1" markets	MISO "Day-2" Market benefit analysis

2–3. Reliability and Resource Adequacy Benefits and Generation Capacity Cost Savings				
Transmission Benefit		**Benefit Description**	**Approach to Estimating Benefit**	**Examples**
2. Reliability and Resource Adequacy Benefits				
a.	Avoided or deferred reliability projects	Reduced costs on avoided or delayed transmission lines otherwise required to meet future reliability standards	Calculate present value of difference in revenue requirements of future reliability projects with and without transmission line, including trajectory of when lines are likely to be installed	ERCOT All RTOs and non-RTOs ITC-Entergy analysis MISO MVP
b.	Reduced loss of load probability Or:	Reduced frequency of loss of load events (if planning reserve margin is not changed despite lower LOLEs)	Calculate value of reliability benefit by multiplying the estimated reduction in Expected Unserved Energy (MWh) by the customer-weighted average Value of Lost Load ($/MWh)	SPP (RCAR)
c.	Reduced planning reserve margin	Reduced investment in capacity to meet resource adequacy requirements (if planning reserve margin is reduced)	Calculate present value of difference in estimated net cost of new entry (Net CONE) with and without transmission line due to reduced resource adequacy requirements	MISO MVP SPP (RCAR)
3. Generation Capacity Cost Savings				
a.	Capacity cost benefits from reduced peak energy losses	Reduced energy losses during peak load reduces generation capacity investment needs	Calculate present value of difference in estimated net cost of new entry (Net CONE) with and without transmission line due to capacity savings from reduced energy losses	ATC Paddock-Rockdale MISO MVP SPP ITC-Entergy
b.	Deferred generation capacity investments	Reduced costs of generation capacity investments through expanded import capability into resource-constrained areas	Calculate present value of capacity cost savings due to deferred generation investments based on Net CONE or capacity market price data	ITC-Entergy
c.	Access to lower-cost generation	Reduced total cost of generation due to ability to locate units in a more economically efficient location	Calculate reduction in total costs from changes in the location of generation attributed to access provided by new transmission line	CAISO (PVD2) MISO ATC Paddock-Rockdale

4–7. Market, Environmental, Public Policy, and Economic Stimulus Benefits				
Transmission Benefit		**Benefit Description**	**Approach to Estimating Benefit**	**Examples**
4. Market Benefits				
a.	Increased competition	Reduced bid prices in wholesale market due to increased competition amongst generators	Calculate reduction in bids due to increased competition by modeling supplier bid behavior based on market structure and prevalence of "pivotal suppliers"	ATC Paddock-Rockdale CAISO (PVD2, Path 26 Upgrade)
b.	Increased market liquidity	Reduced transaction costs and price uncertainty	Estimate differences in bid-ask spreads for more and less liquid markets; estimate impact on transmission upgrades on market liquidity	SCE (PVD2)
5. Environmental Benefits				
a.	Reduced emissions of air pollutants	Reduced output from generation resources with high emissions	Additional calculations to determine net benefit emission reductions not already reflected in production cost savings	NYISO CAISO
b.	Improved utilization of transmission corridors	Preserve option to build transmission upgrade on an existing corridor or reduce the cost of foreclosing that option	Compare cost and benefits of upsizing transmission project (e.g., single circuit line on double-circuit towers; 765kV line operated at 345kV)	
6.	**Public Policy Benefits**	Reduced cost of meeting policy goals, such as RPS	Calculate avoided cost of most cost-effective solution to provide compliance to policy goal	ERCOT CREZ ISO-NE, CAISO MISO MVP SPP (RCAR)
7.	**Employment and Economic Development Benefits**	Increased full-time equivalent (FTE) years of employment, economic activity related to new transmission line, and tax revenues	A separate analysis required for quantification of employment and economic activity benefits that are not additive to other benefits.	SPP MISO MVP

8. Other Project-Specific Benefits				
Transmission Benefit		Benefit Description	Approach to Estimating Benefit	Examples
8. Other Project-Specific Benefits				
a.	Storm hardening	Increased storm resilience of existing grid transmission system	Estimate VOLL of reduced storm-related outages. Or estimate acceptable avoided costs of upgrades to existing system	ITC-Entergy
b.	Increased load serving capability	Increase future load-serving capability ahead of specific load interconnection requests	Avoided cost of incremental future upgrades; economic development benefit of infrastructure that can	
c.	Synergies with future transmission projects	Provide option for a lower-cost upgrade of other transmission lines than would otherwise be possible, as well as additional options for future transmission expansions	Value can be identified through studies evaluating a range of futures that would allow for evaluation of "no regrets" projects that are valuable on a stand-alone basis and can be used as an element of a larger potential regional transmission build out	CAISO (Tehachapi) MISO MVP
d.	Increased fuel diversity and resource planning flexibility	Interconnecting areas with different resource mixes or allow for resource planning flexibility		
e.	Increased wheeling revenues	Increased wheeling revenues result from transmission lines increasing export capabilities.	Estimate based on transmission service requests or interchanges between areas as estimated in market simulations	SPP (RCAR) ITC-Entergy
f.	Increased transmission rights and customer congestion-hedging value	Additional physical transmission rights that allow for increased hedging of congestion charges.		ATC Paddock-Rockdale
g.	Operational benefits of HVDC transmission	Enhanced reliability and reduced system operations costs		