BEFORE THE UNITED STATES DEPARTMENT OF ENERGY
OFFICE OF ELECTRICITY

Procedures for Conducting)
Electric Transmission)
Congestion Studies)

COMMENTS OF AMERICANS FOR A CLEAN ENERGY GRID

I. Introduction

Pursuant to the "*Notice of procedures for studies and request for written comments*" published on August 23, 2018, in the Federal Register (at p. 42647), Americans for a Clean Energy Grid respectfully submits its comments on the Office of Electricity's (OE) proposed process for meeting its statutory obligation[1] to prepare a triennial study of electricity transmission congestion.

Americans for a Clean Energy Grid ("ACEG") is a diverse coalition of transmission industry stakeholders and public interest advocates including electric utilities, transmission owners, operators, and developers, environmental advocates, transmission technology developers, public interest groups, industry associations, and others. Initially organized as a project of the Energy Future Coalition, itself a project of the United Nations Foundation, ACEG was separately incorporated in 2017 as a Virginia non-profit (non-stock) corporation and has applied with the Internal Revenue Service to be recognized under Section 501(c)(3) of the Internal Revenue Code. Extensive further information is available at ACEG's website, www.cleanenergygrid.org.

The ACEG coalition has come together in service to a common recognition that the high-voltage bulk power transmission system must be further expanded, modernized, and integrated to enable the ongoing beneficial electrification of the U.S. economy and society in an optimally affordable, sustainable, reliable, and resilient manner. ACEG recognizes that adding electric transmission capacity, especially with new rights-of-way, is extraordinarily costly, difficult and time-consuming among major energy-related actions. ACEG further recognizes that much of this difficulty comes from fully understandable objections to the significant land-use footprint of transmission lines, to their associated environmental and aesthetic impacts on the land and its natural and human occupants, as well as to their very substantial costs and the difficulties of allocating those costs into regulated rates paid by those who benefit from the new capacity. Further difficulty comes from the divided regulatory authority governing transmission decisions, with various federal, state, and local authorities approving or supervising key elements of transmission planning, construction, operation, and finance.

ACEG seeks to participate in those public activities that may have the effect of overcoming the obstacles to further transmission expansion, modernization, and integration, and therefore has a direct interest in the Office of Electricity's planned study of transmission

[1] Federal Power Act (16 U.S.C. 791a *et seq*.)

congestion and any recommendations that may result from it. ACEG is pleased to offer the following comments as the Office of Electricity undertakes its work on this study.

II. Congestion is Regional, Transmission is Linear

ACEG agrees with the definition of congestion identified by OE, "when a constraint within a given area's transmission network prevents the network from accommodating all transactions desired at a given time by authorized users." In its notice, OE therefore clearly recognizes that congestion is a network phenomenon, one that affects the entire region covered by that network.

New transmission capacity, however, is expanded through individual linear projects, and only rarely through multiple linear projects (as in the case of the MISO MVP projects). Although the underlying statute and DOE's notice refers to transmission "corridors," ACEG submits that the term is not truly appropriate for analysis of congestion. Congestion does not arise in "corridors," but instead affects entire regions. Additional transmission capacity can only be developed in individual pieces and projects, but can normally be added in any of several configurations within a congested region so as to allow the electrons to flow more easily to the load. There is seldom a unique point-to-point transmission route or "corridor" that alone can address a region's congestion. Engineering analysis serves to try to identify least-cost, least-impact alternative among the various options.

The conflict between the regional nature of congestion and the linear nature of the transmission projects that can alleviate congestion presents a practical misalignment of problem and solution that OE must keep in mind in performing its required congestion study: while the investments that can relieve congestion require siting, permitting, and investment for linear facilities, with linear environmental, aesthetic, and land-use impacts, those investments cure congestion, create benefits and offer access to more reliable and often lower-cost energy throughout the market region served by the network of which that new transmission line becomes a part. This is the case particularly in organized markets governed by Independent System Operators or Regional Transmission Organizations, but also in any interconnected region, as the electrons flow where they will as a matter of system resistance, not necessarily along the linear paths that received the investment in new capacity.

The opposition to a new transmission project commonly arises along its linear path of impact from landowners, neighbors, communities, and indeed individual states. These groups reasonably argue that they are asked to bear the greatest environmental burden of such a line (and indeed standard cost-of-service regulation may also assign them a significant share of the cost of such a line), while the economic, environmental, and reliability benefits of such a line in fact flow to a broader market or networked region that is frequently not asked to contribute proportionately to its costs, if at all. They are often correct in that contention. However, they are thus inclined to work to prevent investments in transmission whose benefits vastly outweigh their burdens from a broader societal viewpoint.

There is a wealth of analysis presenting and quantifying the many benefits of transmission.[2] Few of the benefits attributed to transmission are exclusive to the actual route or "corridor" in which it is constructed. Most of the key benefits indeed accrue to customers throughout the region served by the network of transmission that the new project has joined. And new transmission investments can often pay for themselves from the energy cost savings they enable. ACEG has sponsored analysis showing that in both the MISO[3] and PJM[4] regions, the addition of new capacity to provide greater access to zero-variable-cost renewable energy suppresses the cost of energy throughout those markets by pushing other resources with meaningful variable fuel or operation costs out at the margin – and does so with a net savings to the market region in its cost for delivered energy after accounting for the cost of the needed transmission capacity.

For transmission projects, individual states tend to be the largest jurisdictional entities with the authority to review and approve transmission projects. Many key decisions are within the purview of local municipal and county authorities along the right of way on such matters as zoning, route deviations, property taxation, environmental protection, and construction practices. No one is usually there to speak, much less decide, on the merits of a given project on behalf of the entire regional market it will affect.

Seen from the other perspective, an entire region might benefit from resolving the challenges of siting, permitting and constructing capacity that could ease congestion preventing that region's access to more reliable and lower cost energy, but proposals to relieve that congestion are uniformly proposed, studied and approved or disapproved with regard to the narrow corridor where its impacts occur and where the benefits comprise only a small portion of the overall benefit of the project. This disparity between the wide regional benefits and the narrow linear impacts and regulatory approval and cost-allocation processes builds into the US electricity system a profound bias against adding the cost-effective and beneficial transmission capacity that ought to be developed and constructed.

Thus, in analyzing congestion in the US grid, OE should recognize this disparity and recommend means of mitigating its effects, potentially including better compensation for those who actually occupy the physical footprint of a transmission project, and perhaps drawn from greater allocation of the system costs to the broad regional market that actually obtains the bulk of its benefits. OE should analyze all the quantifiable benefits of reducing transmission congestion and the full areal extent to which they are felt. OE should indeed seek to include benefits that are difficult to quantify, such as improved reliability or resilience, perhaps using an insurance model weighing the costs of an outage against the costs of reducing the risks of an outage through the transmission investment. OE should compare the value of those benefits to the traditional allocation of the costs of that transmission given current jurisdictional boundaries

[2] The Brattle Group for WIRES, *The Benefits of Electric Transmission: Identifying and Analyzing the Value of Investments*, July 2013 (http://www.wiresgroup.com/wires_reports.html).
[3] Synapse Energy Economics, Inc. for the Energy Future Coalition, *The Potential Rate Effects of Wind Energy and Transmission in the Midwest ISO Region*, February 2012 (http://www.synapse-energy.com/project/transmission-study).
[4] Synapse Energy Economics, Inc. for the Energy Future Coalition, *Benefits of Wind and Transmission in PJM*, July 2013 (http://www.synapse-energy.com/project/benefits-wind-and-transmission-pjm).

and regulatory practices. OE should then quantify and display geographically any resulting contrast between the beneficiaries of the reduction in congestion and the assignees of the costs.

To the extent that this suggests revisiting the jurisdictional reach and mandates of those authorities involved in weighing the costs and benefits of transmission so that there is a new balance in their assessment and their assignment, OE obviously cannot by itself remedy the current imbalances, but it can point out the need in a straightforward manner and thereby offer authoritative evidence to those involved in the proceedings where it matters. Nothing would be more likely to ease congestion in transmission than a re-balancing of the costs and impacts landing in narrow corridors against the multiple benefits spread throughout the affected markets and regions. This study offers the opportunity to highlight this current disparity, and ideally to propose meaningful ways to address it.

III. National, Interconnection-Wide and Interregional Networks Should Be Within the Scope of the Study.

This raises the question of how the areas in which benefits should be analyzed should be defined. Given OE's accurate statement that congestion occurs on the transmission "network," ACEG suggests that the most appropriate definition of the areas within which to assess benefits should be driven by the physical interconnections within which electrons can flow. Effectively, therefore, the entire continental United States (and adjacent portions of Canada and Mexico) might be assessed as three interconnected areas: the Eastern Interconnection (EI), the Western Systems Coordinating Council (WSCC), and the Electric Reliability Council of Texas (ERCOT).

ACEG understands that for jurisdictional reasons such interconnections may defy significant linkage, and such opposition may be politically impossible to overcome (although there are limited operating interconnections today among the three regions). But that does not mean we should decline to assess and recognize the potential benefits of minimizing such economic congestion and achieving a truly national high-voltage grid. Only if such potential benefits are identified will there be an incentive to obtain them.

ACEG thus recognizes that OE must take the system as it is, but nonetheless urges OE in its approach to the study to recognize fully the enormous potential of additional transmission capacity to overcome current physical constraints that create such widespread economic congestion. In doing so, there is no more thoroughly analyzed and timely resource for OE's review and incorporation into its congestion analysis than the study performed by the National Renewable Energy Laboratory with academic researchers from the University of Iowa and others, released on July 30, 2018. The Interconnections Seam Study ("Seams Study")[5] is a remarkable analysis that points the way toward the ultimate integration of the U.S. power grid, one that will provide consumers with access to lower-cost, more reliable, and cleaner electricity.

The report's conclusions were clear and forceful: under the basic conditions assumed in the study, each of the transmission expansion scenarios studied to link the Eastern and Western

[5] National Renewable Energy Laboratory presentation at TransGrid-X Symposium, July 2018, available at: https://cleanenergygrid.org/wp-content/uploads/2018/08/NREL-seams-transgridx-2018.pdf.

interconnections (designs 2a, 2b, and 3) were all rated "very attractive", because they offered benefit-to-cost ratios of $2.48. $3.30, and $2.52 for each $1.00 invested, respectively. These were conservative estimates based only on the first 15 years of operating the new transmission lines; the study recognized that the upgrades would continue providing billions of dollars in annual benefits for decades after that.

Even within the current three interconnections, there is potential for interregional transmission that would achieve significant economic benefits relative to its costs. FERC has ordered its regulated RTOs and ISOs to consider this potential, but their planning focus has remained internal to their regions. Limiting the analysis of congestion to existing NERC regions, ISOs, RTOs, or smaller regions or market areas when physical transmission networks already exist in still broader regions would ignore both some existing and huge potential for interregional transmission to reduce economic congestion.

IV. Inadequate Transmission Service from Areas of Potential Low-Cost Generation Constitutes A Form of Economic Congestion

The notice identifies "economic congestion" as the initial form of three forms of congestion, when "the transmission system's capacity is adequate to enable compliance with NERC reliability standards, but is not able to allow purchasers of wholesale power to obtain supplies from the least-cost sellers at all times." As defined, however, this seems to presume that the low-cost generation must already be in place and the transmission must be inadequate to connect it to existing load. The problem with defining economic transmission in this manner is that it is completely out of step with the lead-time realities of today's electricity industry.

A new natural gas combined-cycle combustion turbine, a new multi-turbine wind farm, or a new central utility-scale solar array can be put into operation within about two years from the decision to proceed. These are not only the quickest generation to add today, they are also the most economic. New transmission capacity, however, appears to take a minimum of ten years to put into operation given the impact studies, permitting processes, layers of regulatory authority, and multiple final regulatory and land-use decisions that must precede the actual procurement and construction processes. There is no alternative to transmission in moving bulk power to market. But no one can build a gas, wind, or solar generating facility and then wait eight years for the ability to transmit their generated energy to market.

Today we experience the reverse of the historic sequence, when large central plant permitting and construction required a minimum of several years to complete a new powerplant, and in recent years, often more than a decade. Transmission planning and construction could generally wait until the generation facility was fully committed and still be completed and available when the generator was turned on. This is no longer the case.

In short, it is clear that transmission planning and construction now must **anticipate** development of generation resources or we will have significant economic congestion. We know where the most promising renewable resource areas are, and abundant natural gas also exists where transmission capacity does not now allow it to be converted to power and exported. Yet there is no regulatory or market mechanism to ensure that this form of passive economic

congestion, which effectively pre-empts our most cost-effective generation, is being addressed. DOE should address this form of economic congestion and suggest mechanisms to alleviate it, including steps the federal government itself could take on federal lands and as a means of promoting least-cost energy supply for a growing economy.

This congestion study should thus analyze and identify as economic congestion not merely those instances where **existing** lower-cost generation resources are denied access to markets for lack of transmission capacity, but also those instances where **undeveloped** lower-cost resources clearly exist that cannot be developed until the required transmission capacity is not only planned but being actively developed.

V. Transmission's Ability to Provide Reliability and Resilience Should be Included in the Study

The notice indicates that reliability congestion becomes an issue when NERC standards are not met, which is certainly true, but ACEG suggests that the insurance value of transmission should be appraised not merely against NERC standards, but against alternative means of insuring that power systems can sustain operations under duress and be restored quickly after a major disruption. The notice states that "at the federal level, requirements designed to ensure system resilience and security under extreme stress (e.g., natural disasters or cyber/physical attacks) could create a demand for additional transmission capacity in specific locations."

Yet DOE's own policy approach to resilience, as represented in proposals to the Federal Energy Regulatory Commission, which has jurisdiction over transmission but not generation, appears to emphasize on-site fuel and islanding self-sufficiency at power plants rather than support from interconnected resources elsewhere through the grid. The study offers an opportunity to clarify these alternatives.

The study should address the relative performance of transmission in maintaining and restoring service in storm-damaged areas during such major events as Hurricanes Harvey and Florence compared to generation-site measures. The study should also ensure that potential reliability benefits are quantified and included in evaluating transmission congestion as well as responsive proposals and potential.

VI. Congestion that Blocks Achievement of State Policy Goals Should be Seen as the Equivalent of Economic Congestion

Duly adopted policy goals, such as state-adopted renewable portfolio standards, should not be considered as of lesser importance in appraising the sources or mitigation of congestion than economic congestion. This is because a state's policy goals are adopted in view of that state's public interest, with the clear understanding that the power consumers of that state would be expected to reimburse its utility providers any incremental economic costs required to meet the policy. Additional transmission capacity to deliver clean energy from distant locations is frequently the lowest cost means of meeting renewable energy portfolio standards. The absence of such transmission capacity would condemn that state to pay an economic penalty from

meeting the standard in another, more expensive way, and thus equates directly to economic congestion.

Many of the nation's largest corporations have also adopted clean energy procurement goals, and transmission capacity is likely to be necessary for them to meet such goals.[6] Corporate procurement goals should similarly be equated with economic congestion as a motivator for new transmission, and a rationale for reducing economic congestion at least as strong as that posed by general energy pricing differentials. Corporations are legally required to optimize their economics and should not be second-guessed in how they elect to do so, potentially recognizing economic value in clean energy that transmission system planners or public authorities might fail to see.

VII. The Congestion Study Should Demonstrate that Distributed Resources Can Help Offset Congestion but Cannot Substitute for the Central Grid

The electricity industry is clearly in the throes of a rising tide of new technologies at all levels, including new transmission technologies that will enhance the existing systems capacity, cost-effectiveness, and reliability. Perhaps the most salient and revolutionary wave among those new technologies are the generation, storage, demand-management, digital command and control, and transportation technologies that are available to retail consumers, and promise to change retail end-use customers' relationships to the electric system and their utilities dramatically.

Lumped together under the term "distributed resources," these technologies will allow customers who are willing to make the investment and commitment to become active in meeting their own electricity needs and optimizing their economics and reliability. Indeed, with the trends in costs for self-generation and greater appliance, lighting, and building efficiency, some have suggested that customers in many parts of the US will soon find it economically and technically viable to leave the central grid altogether. Making this directly relevant to the planned congestion study, such technologies have frequently been called "non-transmission alternatives" or "non-wires alternatives."

It is certainly true that customers installing distributed generation, storage, and improved system management technologies can improve their own reliability and resilience, and, in large numbers, offer general system support by reducing their load at critical times through demand response, and that these measures can have an ameliorative effect on congestion. But ACEG does not believe that distributed resources represent a significant means of eliminating transmission congestion whether defined by economic, reliability, public policy, or other characterizations.

ACEG therefore suggests that the DOE Congestion Study should review the contention that distributed energy resources can and will, over time, make the central transmission system superfluous and obsolete, and therefore render the transmission grid not worthy of additional

[6] David Gardiner and Associates for the Wind Energy Foundation, *Transmission Upgrades & Expansion: Keys to Meeting Large Customer Demand for Renewable Energy*, January 2018 (https://www.dgardiner.com/wef-dga-report-transmission-needed-meet-corporate-americas-growing-demand-renewable-power/).

investment or interconnection. ACEG believes that an extended, integrated, modernized transmission grid will remain critical to affordability, reliability, and sustainability of the US electric system indefinitely, particularly for large urban markets, industrial loads, high-voltage loads, and in achieving access to rich but remote clean energy resources.

The Department of Energy is in a position to address this debate and significantly resolve it, and this study presents an excellent vehicle for doing so because distributed resources are held out as an alternative to transmission and an answer to unreliability and congestion on the grid. There is no need to diminish the impressive potential of distributed resources to conclude that they have the potential to serve their owners well in individual circumstances, but do not have the potential to backstop nor displace the central grid in the foreseeable future.

VIII. Conclusions

ACEG is pleased to have had the opportunity to provide these comments on the procedures and proposed content of the congestion study DOE will perform, and looks forward to further opportunities to offer thoughts and assistance.

Respectfully submitted,

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