ERM POLICY ALERT:

June 2024

The Race to Electrify: Meeting US Decarbonization Goals through Rapid Transmission Expansion

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What we know:

To meet US decarbonization goals, we need to build electric transmission lines at a breakneck pace to connect new, clean sources of electricity to the grid, and interconnect different grids so that demands and intermittent supply sources can be better matched. Princeton University has estimated that we will need to more than double the rate at which we historically add transmission capacity (about 1%/year), and that if we stay at our historical pace, we risk losing roughly 80% of the carbon reduction benefits that the Inflation Reduction Act (IRA) is expected to deliver (repeatproject.org).

What we're learning:

The analyses that supported IRA, and essentially all analyses done by utilities as recently as 2 or 3 years ago, didn't fully account for how much more electricity we will need due to rapidly rising demand from data centers. Utilities and regional transmission organizations' forecasts for data center growth began to appear in earnest in 2023, well after IRA analyses were done. A typical data center not long ago might have needed 10s of megawatts (MW) of power; 100–200 MW is common and reports of "hyperscalers," with power needs upwards of 800 MW to 1 gigawatt of power are percolating across the country. These "hyperscalers" are being driven by our increasing demand for streaming, apps on our phones, and artificial intelligence (AI) training needs and AI-driven applications. A 2024 Electric Power Research Institute whitepaper states that "AI queries are estimated to require 10x the electricity of traditional Google queries." (Powering Intelligence: Analyzing Artificial Intelligence and Data Center Energy Consumption)

A "standard" data center not long ago might have needed 100 Mw of power; it's not uncommon for data centers now to need upwards of 800 Mw to 1 Gw of power

Electric Power Research Institute estimates that by 2030, data centers will account for huge power demands in some states, led by Virginia (where scenarios data centers will consume 29% to 46% of load and from over 40 terawatt-hours /year to nearly 90 terawatt-hours /year), but with other states such as Texas, California, Washington, and New York following closely behind. All that will require substantial new transmission, above and beyond what's needed to add clean power to the grid for decarbonization alone.

Here's what's new:

The federal government recently released four new, important changes to the way transmission will get built. Alone, the pieces would be significant; taken together, the four could represent a true turning point.

1. New Federal Energy Regulatory Commission (FERC) Orders. FERC released two complementary orders in May, Order 1920 and Order 1977.

Order 1920 is designed to accelerate transmission planning by focusing on four areas: (a) the planning horizon, (b) the use of scenarios in planning, (c) how transmission solutions are selected, and (d) how costs are allocated. FERC now requires transmission providers to participate in a planning process with at least a 20-year planning horizon, to better anticipate changing demands and supplies on the grid. Moreover, given the uncertainties inherent in a 20-year horizon, that planning must utilize three scenarios, and companies are required to revisit and revise their scenarios every 5 years.

Perhaps most importantly, as they undertake their analysis, transmission providers must consider seven key types of benefits to transmission as they undertake their analysis. To what extent does the proposed transmission:

(1) Avoid or defer other transmission replacement;
(2) Reduce loss of load probability or needed planning reserve margin;
(3) Increase production cost savings;
(4) Reduce transmission losses;
(5) Reduce congestion due to transmission outages;
(6) Reduce the effects of extreme weather events; and
(7) Reduce peak energy losses and the costs of capacity.

Moreover, the rule requires transmission providers to file at least one cost allocation method, with costs being commensurate with benefits. As part of this process, transmission providers must open a 6-month engagement period to provide sufficient time and a forum for negotiations with relevant state entities on the cost allocation method.

Finally, Order 1920 adds requirements on (a) transparency, which in this context means that they must conduct stakeholder meetings, (b) "right sizing," which means companies must consider opportunities to increase an existing line's transfer capability, and (c) interregional coordination, which means working to revise existing interregional coordination to reflect the new process and transfer capacities and expectations.

Takeaway: FERC's calculation is that better planning, coordination, consideration of benefits and stakeholder engagement will result in a more optimally built grid, perhaps obviating the need for some lines, reducing the number of unneeded lines, reducing lines delayed or blocked by insufficient stakeholder engagement. This combination – fewer and "smarter" builds will very likely reduce the overall time spent building transmission on a system-wide level, but it may in-fact increase the time spent on any given line, since the rule adds regulatory requirements. FERC's goals are laudable and logical, but not without their own time costs. On balance, given how long it takes to build a line, we should expect the overall system to be built more quickly, since the analysis and stakeholder requirements should be less time-burdensome than building sub-optimal new transmission lines. And, on balance, the overall transmission system should be more fit for purpose in the long run.

2. Order 1977 addresses the siting process. The rule is identified as a "Backstop Transmission Siting Procedure." In 2021 Congress amended the Federal Power Act to give FERC permitting authority in National Interest Electric Transmission Corridors (NIETCs) if a state previously rejected an application (hence the "backstop"). One point of debate leading to the final rule was whether state and federal permits in NIETC corridors could be filed simultaneously. The commission declined to allow this, and states have a full year to process an application for a new permit in a NIETC before a backstop filing can be made to FERC.

Order 1977 tries to balance the rights of landowners and affected stakeholders with the imperative for new transmission to be built in priority areas (NIETCs). Under the rule, applications require early engagement with affected landowners, environmental justice (EJ) communities (EJ Community of Concern), tribes, and local communities. The rule protects stakeholders by including (a) a "Landowner Bill of Rights," (b) an "Applicant Code of Conduct," (c) a requirement for applicants to produce Tribal Resource Reports and Tribal Engagement Plans, and (d) a requirement for applicants to produce an EJ Public Engagement Plan.

The Landowner Bill of Rights states that transmission applicants must provide affected landowners with information about their rights to intervene in any open Commission proceeding and to send affected landowners the Landowner Bill of Rights in its pre-filing notification. The (voluntary) "Applicant Code of Conduct" is a vehicle for applicants to demonstrate early engagement with affected landowners and stakeholders, including recordkeeping and honoring information-sharing requirements. If applicants don't use the Applicant Code of Conduct, they nevertheless must demonstrate "good faith efforts" to engage landowners as required under the Bipartisan Infrastructure Act. Finally, the EJ Public Engagement Plan requires applicants to describe their outreach toward EJ communities, summarize comments received from those communities and describe efforts to engage and accommodate people with limited English proficiency.

Takeaway: Order 1977 strikes a balance. FERC could have chosen a more expeditious path by allowing concurrent applications, but the order's language gives states more control over the application process and adds up to a year of potential additional time before a transmission line could be built in a priority corridor. Similarly, FERC could have chosen to minimize the process at the federal level, as applications denied by the states presumably already would have had heavy input from stakeholders. Instead, FERC instituted safeguards to ensure that stakeholders have the opportunity to voice their concerns. Order 1977 will not expedite transmission builds but will encourage transmission to be built where it otherwise would have stalled.

3. The U.S. Department of Energy's designation of **NIETCs.** In May of 2024, The US Department of Energy (DOE) issued a preliminary list of 10 corridors; public comment closed on June 24; DOE's Public Engagement phase is next, and formal designations will follow.

The Federal Power Act authorizes DOE to designate an area a NIETC if new transmission would advance national interests. Determination is based on multiple studies and input that take into account existing and expected grid congestion, transmission capacity constraints, and barriers to development including permitting, siting, and regulation. National interest may include high electricity cost, environmental justice, environmental, and clean energy issues (e.g., connecting remote clean power to the grid) and more. An NIETC designation can help transmission-owning utilities unlock access to federal financing from the Transmission Facilitation Program and the Transmission Facility Financing Program. As noted above, an NIETC designation also grants FERC backstop permitting authority if a state denies an application.

As shown in the map on Figure A, below , there are several NIETCs, including two large ones. One of these, Northern Plains, runs from North Dakota through Nebraska, with several linkages in South Dakota and Nebraska. The second is a series of corridors, including Plains Southwest, Mountain-Plains-Southwest, Delta-Plains and Midwest Plains. This series starts in New Mexico north of El Paso, carries into Colorado and then extends eastward, skirting ERCOT , to the Illinois-Ohio border and separately to Arkansas. The Northern Plains line seems designed to unlock the "Saudi Arabia of wind" (as North Dakota has often been called) and bring that massive energy potential to the Midwest. Similarly, the southern corridors seem designed to bring southwest solar to the Midwest. Most notably, the connection of the Midwest Plain route with the Delta Plains route, and in turn with Plains Southwest, would open a new connection between the Eastern Interconnect (EIC) and the Western Interconnect (WECC). The Midwest-Plains route alone is a 780-mile corridor that touches the PJM, MISO, and SPP grids.

Takeaway: Interconnecting regions of high renewable energy potential but low demand with areas of high demand and lower renewable potential has long been a goal of clean energy policy studies. The proposed NIETC connections not only facilitate more clean power but would also enable balancing areas to take best advantage of different times of production and times of demand across regions (when maximum potential wind or solar power is being produced may not be the time of highest demand in that region; long distance connections could allow high demand in Chicago or Little Rock to be served by high solar production far away). Moreover, the proposed connection between EIC and WECC would facilitate a new generation of energy imbalance markets, allowing a greater range of supply options to compete for demand. Finally, opening supply sources by connecting them to different demands should have the effect of mitigating local market power pricing and spurring utilities to reassess the value of their existing and planned assets.

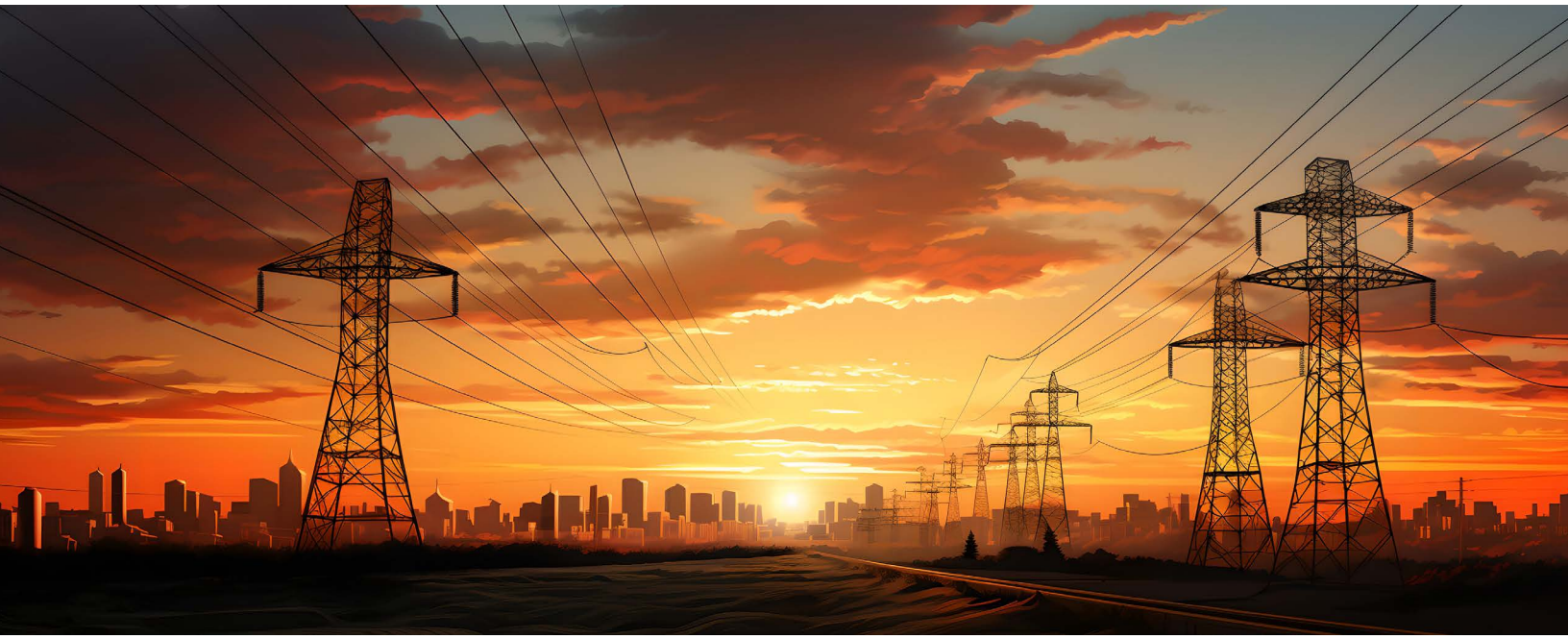
Figure A[1]

[1] National Interest Electric Transmission Corridor Designation Process | Department of Energy.

4. The **Coordinated Interagency Transmission Authorizations and Permits Program** (CITAP), announced by the DOE in April, is intended to streamline Federal permitting of transmission.

CITAP aims to reduce the total time to site and permit from 4 years on average to 2 years. The reduction is accomplished by DOE acting as a lead agency for federal environmental reviews and coordinating an interagency review. Most significantly, CITAP establishes a 2-year deadline to issue permits and authorizations, and if an agency does not adhere to the 2-year deadline, developers can begin an appeal process to request the sitting US President to issue the appropriate permit. Like with other rules described here, CITAP also insists on a public participation plan; the process is not intended to short-circuit processes but expedite them.

Takeaway: CITAP does not eliminate NEPA, CWA, ESA , or other reviews; rather, it designates DOE as a central coordinating body. Coordination by federal agencies may make it easier for applicants to understand where their applications sit and simpler to interact with federal agencies; however, coordination in and of itself will not speed up reviews. The 2-year ticking clock should act as a forcing function, but it remains to be seen how quickly agencies will be able to perform their roles as safeguards of environmental and community protections.



Where might all of this lead:

The two FERC orders, NIETC designations, and CITAP have the potential to make permitting, siting, construction, usage and cost of transmission lines faster, cheaper, and more efficient, and are likely to help usher in some of the benefits of our nation's clean energy potential that have been dormant or trapped. But none of the effects will be felt overnight. Building transmission is still slow work; minimizing harms to the environment and respecting stakeholder and landowner rights are vital and, and large bureaucracies don't often move quickly. The transmission system and the generation system are poised for large-scale changes, but this is a long game that will play out over years if not decades.

Regardless of the timing of these federal shifts, data centers are coming, electric vehicles (EVs) are being bought and driven, and electrification of many energy uses is underway. Demand won't wait for supply, and that means we'll see a short-term picture different from the evolving long-term one. As reliable power becomes a priority, data centers might favor locations with ample power due to the proximity (for low latency) and access to fiber optic networks. Might we see a future where latency is less important because power is a more serious limiting factor? Or might we perhaps begin to see data center developers absorb the cost of adding new fiber optics networks to areas where they're insufficient but where power is more readily available? Some large energy users will find creative ways to produce their own "behind the meter" power and operate off-grid, utilizing renewable energy and storage systems, particularly in remote locations. These strategies reflect a balance between power reliability, latency, and infrastructure costs, adapting to the growing demands of the energy economy.

A darker view is that the system may break before solutions are in place. Increasing mega-heatwaves like the one experienced by over 100 million people in June 2024 in the U.S. will continue to stress the nation's grid; the imperative to decarbonize will motivate electrification of our cars and our industries; and demand for AI-driven products shows no sign of slowing. If reforms put in place by the federal government don't result in near-term changes to how and how quickly we build out our transmission grid, we must brace ourselves for the possibility of rolling brownouts or blackouts becoming a regular facet of our year. Timing is everything. We have been in a race against the climate clock, but we're now also in a race against ourselves.

Utilities, data centers, and other large energy users, as well as regional planners will need to find ways to move as quickly as possible, and in an environment where stakeholder engagement, EJ, and environmental impacts will be scrutinized ever more carefully because of the volume of activity happening. Coordination with environmental and energy regulators, planning commissions, and stakeholder groups will be key; careful balancing of interests will be central; and, perhaps most critically, earlier engagement with these interests will be a must.

Contact

Michael Leifman
Partner, Climate Change
michael.leifman@erm.com

Michael Leifman is a partner at Environmental Resources Management (ERM), the world's largest pure play sustainability consultancy. ERM helps its clients along all stages of their decarbonization journey, including decarbonization strategy, carbon markets; financial and regulatory intelligence, policy analysis, asset portfolio planning – including asset repurposing, permitting, siting, & operations, and resilience planning. With expertise across the value chain, ERM has safely and successfully delivered thousands of energy projects in North America over the past 50+ years, including over 5,000 miles of transmission delivered and over 160 GW of renewable capacity installed.