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REGULATORY ASSISTANCE PROJECT

FERC Transmission: The Highest-Yield Reforms

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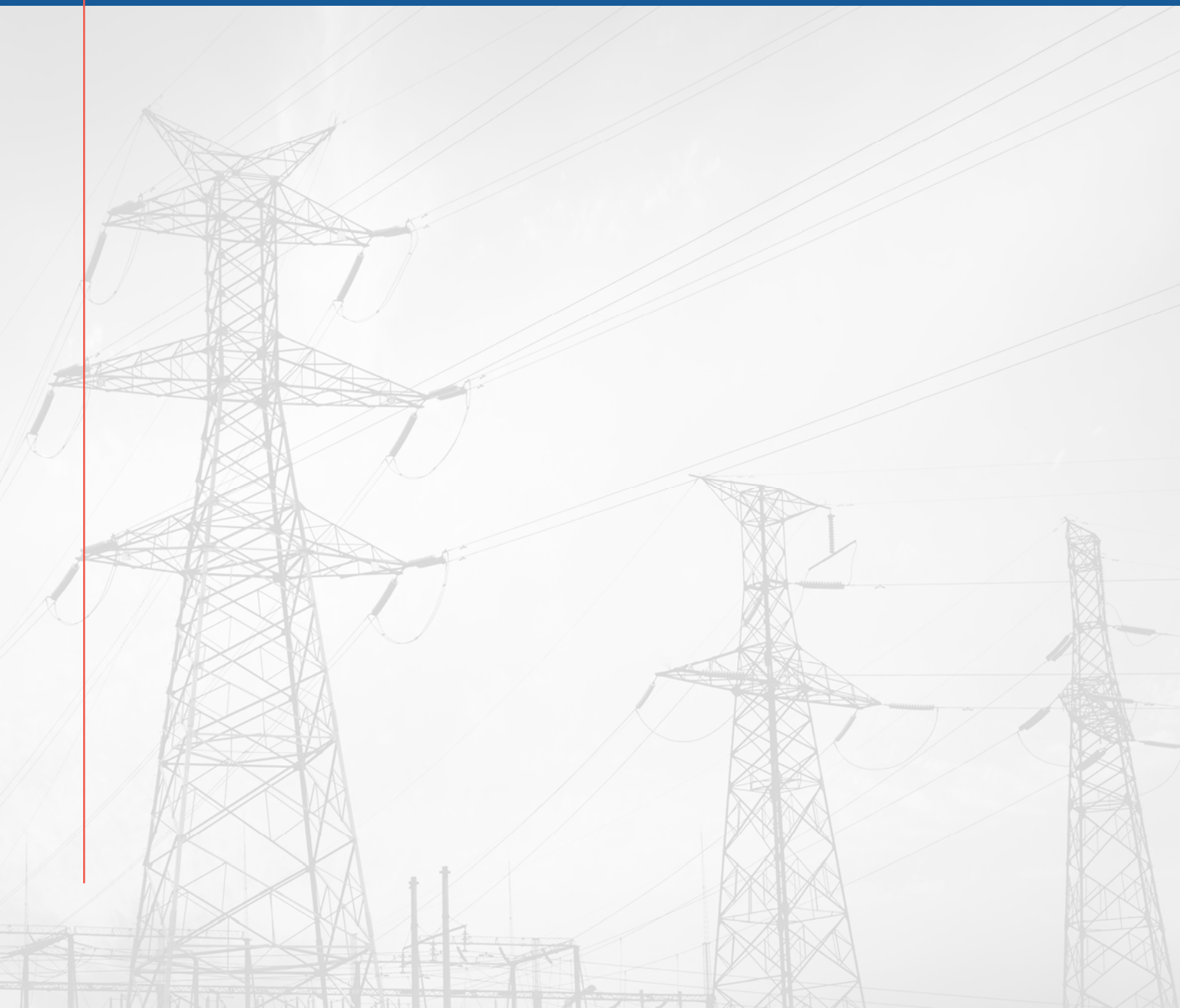

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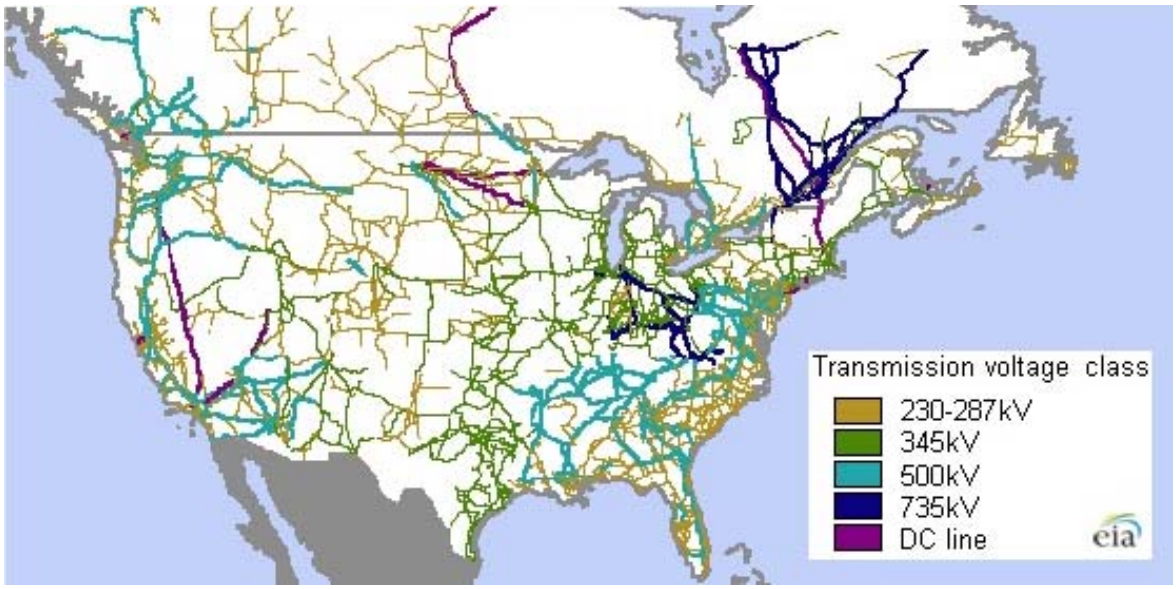
I. Prologue: FERC Order 1000's Mixed Success

Most of America's transmission grid — that is, the system of high-voltage wires and substations that delivers electricity to local distribution systems — was built in the 20th century to serve central power stations burning coal, oil, and more recently, fossil gas and nuclear stations. Many of these power stations[1] are decades-old, inflexible units, expensive to operate, and subject to fuel price volatility and fuel shortages that can lead to serious grid failures when the fuel delivery system fails or fuel is simply unavailable.

Order 1000 is the prologue to FERC's current transmission reform dockets. FERC has recognized the need[2] for federal transmission planning, using competition to encourage market-based projects, and related reforms for more than a decade. Order 1000, adopted in 2011[3], was intended to push transmission planning and funding by regional

Figure 1. U.S. transmission system with connections to Canada



Source: U.S. Energy Information Administration

[1] Federal Energy Regulatory Commission (FERC), Docket RM21-17, 179 FERC ¶ 61,194, Notice of Proposed Rulemaking on June 16, 2022, on improvements to generator interconnection procedures and agreements. A pre-publication version noted on p. 18 that "the Commission adopted these [interconnection] procedures at a time when most interconnection requests were for large traditional generating facilities."

[2] As is still the case 11 years after FERC Order 1000, transmission is not being built that is consistent with state resource policies and mandates in many regions. Further, market efficiency or renewable goals cannot be incorporated into transmission planning in some RTOs. The Midcontinent ISO stands out as a commendable counterexample on this point of having pioneered "multi-value project" approaches to planning and funding projects designed to meet reliability, market efficiency, and new energy developments.

[3] FERC, Order 1000 on July 21, 2011, on transmission planning and cost allocation by transmission owning and operating public utilities. https://www.ferc.gov/electric-transmission/order-no-1000-transmission-planning-and-cost-allocation

transmission organizations (RTOs) and independent system operators (ISOs)[4] forward to consider interregional energy transfers, more competitive transmission, and how to incorporate state energy policy into FERC-regulated transmission processes.

Order 1000 was effective in some regions in lowering barriers to competitive bidding processes, which in turn reduces costs for consumers and provides a conduit for technology and service innovation. That said, FERC Order 1000 failed in moving the RTOs to align their transmission planning and funding processes with state policies and objectives. It also failed on precipitating broader approaches to transmission planning and interregional transmission across the United States. With the possible exceptions of California and New York, no RTO has reformed its transmission planning or funding processes to work with state policy mandates.

II. Focus Should Be On the Highest-Yield Reforms for Consumers

In a world where solar and wind energy are now less expensive than fossil-fuel generated energy — and *much* less expensive when the costs of pollution are considered — it is indisputable that this old transmission system requires a major overhaul to provide reliability in a changing power system and to bring less expensive and cleaner energy from dispersed renewables into urban and commercial load centers.

The bulk power transmission system is a complex web of many interconnected transmission systems, owned by many entities. The regulatory and transmission funding mechanisms are likewise complex and disparate across the United States. As a result, FERC is honing in on failures in planning, interconnection and extreme weather preparation by updating outdated procedures and requirements (see Table 1). In this brief, the authors offer analysis on how to prioritize reforms and where regulators, utilities, and transmission operators should focus their resources and attention. What is the best[5] focus for reform of federal regulation of this complex and disparate set of transmission grids across the United States? We attempt to answer that question by breaking it down into five discrete areas:

- What FERC did think about: interconnection;
- What FERC should be thinking about: *competition*;

[4] "Transmission organizations" and "transmission operators" are used interchangeably in this paper to denote non-RTO transmission organizations responsible for transmission planning and resource interconnection.

[5] By "best" here we mean most likely to yield reliability improvements and the efficient integration of clean energy resources making up 80-90% of these queues.

- What else FERC should be thinking about: integrating offshore wind transmission efficiently and reliably;
- What FERC can do to drive effective implementation: oversight; and
- What FERC knows: To be effective, standards need to be mandatory for RTOs and transmission organizations.

Table 1. Open FERC Proceedings on Transmission Oversight, Planning and Interconnection

Topic of Proceeding	Docket Number	Comment/ Other Deadlines	Notes
Proposed rule on regional transmission planning	RM21-17	August 17, 2022	Would require RTOs/utilities to plan for long-term needs driven by resource mix and demand changes
Proposed rule on generator interconnection	RM22-14	October 2022	Would require RTOs/utilities to modify interconnection processes
Proposed rule on extreme weather planning	RM22-10	Late August/early September 2022	Would require North American Electric Reliability Corp. (NERC) to modify its transmission planning rule to account for extreme weather
Proposed rule on reports about weather vulnerability assessments	RM22-16	Late August/early September 2022	Would require RTOs/utilities to file a report describing processes for conducting weather vulnerability assessment.
Transmission cost containment	AD22-8	Speaker nominations due August 1, 2022	Technical conference scheduled for October 6, 2022
Dynamic line ratings	AD22-5	April-May 2022	In 2021, FERC required RTOs/utilities to use ambient adjusted ratings; notice of inquiry issued February 2022
Transmission incentives	RM20-10		Proceeding opened in March 2020; most recently held a technical conference in September 2021 on shared savings approaches to encourage advanced tech deployment
Cybersecurity incentives	RM21-3	Spring 2021	In December 2020, FERC proposed to incentivize utilities to invest in cybersecurity beyond what is required by law

Source: Ari Peskoe, Harvard Energy Law Initiative

III. What FERC Did Think About: Interconnection

Interconnection is the right place to start with reforms. Transmission owners and RTOs are struggling to process huge backlogs of projects. The prevailing interconnection processes are designed for central-station, largely fossil, units. Current interconnection procedures do not anticipate the types or volume of projects in front of them now. These processes do not ask for information needed to assess the grid and generator needs of a new solar or wind farm, a battery installation, or a combination.

There are huge backlogs for generation to get from a fully engineered project to permission to interconnect (without which a project is not financed). PJM has a queue backlog of 173,602 MW, more than its entire peak load.[6] ISO-NE has an interconnection queue backlog near its all-time peak load.[7] And CAISO has a total queue backlog of 235,513 MW, including storage in queue. Indeed, FERC estimates that there is 1 million MW of generation projects and 400,000 MW of storage waiting in increasingly long interconnect queues nationwide.[8] By way of comparison, the coincident peak load of the lower 48 states was 720,000 MW (720 GW) on August 12, 2021, with total operational capacity of 1.2 million MW.[9]

It is on the one hand encouraging to see such massive numbers of projects — capacity equivalent to today's entire grid — seeking to get onto the grid to generate more efficient and cleaner electricity. But these long queues come at a cost. Generation in largely deregulated regions of the county is now a competitive non-monopoly business. Competitive companies procure their own financing and equity investors. Long delays are daunting to private investors who cannot sustain indeterminate years of waiting. Investors impose fiscal discipline on projects that should occur in markets. Unreasonable delays together with uncertainty lead to private-sector investors going elsewhere. In New England, for example, 70% of projects exit their queue after experiencing long delays. And the wait times are getting worse: National queue wait times

It is encouraging to see such massive numbers of projects seeking to get onto the grid to generate more efficient and cleaner electricity. But these long queues come at a cost.

[6] PJM Inside Lines. (2022, January 5). *PJM 2022 long-term load forecast predicts slight growth*. https://insidelines.pjm.com/pjm-2022-long-term-load-forecast-predicts-slight-growth/

[7] Generation in FERC's jurisdictional active queue is 28,637 MW, with all ISO-NE projects increasing the queue to 31 GW. ISO New England. (2022). *Interconnection request queue*. https://www.iso-ne.com/system-planning/interconnection-service/interconnection-request-queue/

[8] FERC, 2022.

[9] U.S. Energy Information Administration. (2021, August 19). *Electricity demand in Lower 48 states reached a high of 720 gigawatthours on August 12.* https://www.eia.gov/todayinenergy/detail.php?id=49216

for approvals to interconnect have increased from 2.1 years in the decade of 2000-2010 to 3.7 years in the period of 2011-2021.[10] Since a project will not be financed to build until approved for interconnection, these wait times mean a fully engineered and designed project, with full site control and commercially ready to go, must wait almost four years simply on the review of its engineering interconnection details — with no guarantee of an approval.[11] The market discipline of having investors moving equity and loans to the best projects is a good thing, but a process that imposes multi-year delays does nothing to encourage market efficiencies.

These interconnection delays quite clearly benefit incumbent and older generators by keeping new generators off the grid. New generation is most often both more efficient and cleaner. In fact, 90% of the projects pending at the end of 2019 were solar, wind, or energy storage projects.[12] For these reasons, consumers pay for a long time for less efficient power production that is likely more polluting as well — an unsatisfactory situation.

FERC therefore proposes to conclude that existing rules are unjust and unreasonable and result in undue discrimination under the Federal Power Act. To identify reform ideas, FERC relies heavily on states, RTOs, and transmission owners who have been experimenting with solutions. Among the solutions proposed by FERC that hold great promise are:

a. Cluster studies of multiple projects asking to interconnect in a particular area should be performed. This is distinguished from older project-by-project serial consideration. In this way, multiple resources can share the costs of interconnection and grid upgrades in common. The entire costs of an upgrade should not fall on a single interconnecting entity based on an unlucky place in line. And more efficient upgrades for a number of new resources can be evaluated. For these reasons, cluster studies should have been adopted a decade ago, so it is good to see FERC formalize this technical study process. Many transmission provider processes have transitioned to cluster studies already.[13]

b. Interconnection studies must meet deadlines. FERC has proposed firm deadlines and penalties for interconnecting authorities, such as RTOs and transmission operators, missing those deadlines.

c. First-ready, first served has been implemented by several transmission providers and jurisdictions. First-ready, first-served has worked better than older first-come,

[10] FERC, 2022.

[11] Utilities with ability to charge ratepayers for generation may have staying power, as they can charge ratepayers for costs of continuing interconnection. But that may not be efficient, as the private investment community is illustrating.

[12] FERC, 2022.

[13] FERC, 2022.

first-served serial processes — the predominant model. Accordingly, FERC has proposed a transition to first-ready, first-served.[14] There is little doubt that this approach has potential, but the devil is in the details of how it is set forth, determined, and policed. FERC has proposed useful criteria[15] with respect to financing, site control, and commercial readiness. But the Commission has not explained how application of these criteria in practice might be policed.[16] Because one of the lessons of Order 1000 is that ongoing oversight is critical, below we propose and endorse the idea of one or more independent transmission monitors to track how FERC is implementing first-ready first served and other interconnection reforms.

d. Allow combination of resources (called "hybrid resources") in a single interconnection. FERC has proposed requiring that combinations of resources be studied together when proposed for a single point of interconnection (POI).[17] This proposal is a significant improvement, as now it is extremely cumbersome to study a solar-plus-battery, a solar and wind proposal, or a combined wind and solar grid-scale project that can have more advantageous reliability and operational characteristics as a portfolio resource than as individual resources.[18] FERC calls a portfolio of resources operating together behind a single POI a "hybrid resource." FERC further observes the currency of this reform: 42% of solar projects and 8% of battery projects awaiting action are now composed of these types of hybrid projects.[19]

This hybrid interconnection proposal will streamline replacement of old generation with new combinations of resources at existing points of interconnections. That will much more efficiently open the door to replacing or supplementing older resources with portfolios of new resource combinations at the existing POI for a legacy power plant. To the extent these hybrid portfolios of resources occur behind a single POI, hybrid-resource review will provide a route for more efficient and

[14] FERC, 2022.

[15] FERC, 2022.

[16] A rule without a remedy is no right, the axiom goes. Accordingly, an effective oversight mechanism for review of whether RTOs and transmission operators are effectively implementing first-ready, first-served is discussed in Section VI of this paper.

[17] FERC, 2022.

[18] A combined solar, land-based wind, and offshore wind portfolio can reach high availability, e.g., capacity factors, as much as 80% or more. When backed up with hydro, battery or gas generation to "firm up" the resource, the availability or capacity factor will be higher than any single resource. In a prepublication version of the interconnection NOPR (FERC, 2022), the commission noted that ". . . allowing electric storage resources to be combined with variable energy resources (such as wind and solar resources) can reduce their intermittent and prevent sudden changes in out. In addition, wind and solar resources can complement one another because they generally reach peak generation at different times throughout the day (wind in the early morning and late-night hours and solar in the afternoon)."

[19] FERC, 2022.

reliable combinations of resources to be proposed rather than single, resource-by-resource review. With this reform, a portfolio could take advantage of both old and new capabilities to provide more dependable, cleaner, and more resilient energy resource interconnections.

e. New interconnecting customers can take advantage of capabilities of new technologies. These new technologies include advanced inverters and controls to provide reliability services and capabilities such as voltage support and frequency regulation. Modern inverters can be set to provide near instantaneous grid reliability responses for voltage sag or overvoltage and frequency regulation. When reliability issues are identified in interconnection studies, modern inverters and protective equipment can be set to provide or even enhance responses to pre-existing reliability situations on the grid.

   FERC also proposes to require grid operators to study new grid technologies if proposed by an interconnection customer. The Commission calls out advanced power flow control, transmission switching, dynamic line ratings, static synchronous compensators, and static volt-ampere reactive (VAR) compensation as technologies that interconnecting customers should be allowed to propose (with engineering and operational characteristics specified).[20] FERC observes that various of these advanced technologies serve a transmission function: (i) allowing operator optimal transmission switching, (ii) pushing and pulling of power to alternative lines with spare capacity to maximum utilization of existing transmission capacity, (iii) routing energy around areas of high congestion, and (iv) providing more controllable voltage and harmonics, among other advantages.[21]

f. Staffing and resources are needed. FERC touches on the resources needed for planning in its Notice of Proposed Rulemaking (NOPR) for transmission, issued earlier in 2022.[22] Every region and every transmission organization is struggling with staffing and outside engineering support. Feasibility studies, system impact studies, and interconnection facilities upgrade studies benefit from experienced staff and often contracted engineering resources. Interconnecting customers are obligated to pay these costs so who pays is not so much at issue as setting up a system where interconnecting customers pay for adequate staffing and timely review rather than "paying" additionally through delay and studies poorly or incompletely done.

[20] FERC, 2022a.

[21] FERC, 2022a.

[22] FERC, Docket RM21-17, 179 FERC ¶ 61,028, Notice of Proposed Rulemaking on April 21, 2022, on building for the future through electric regional transmission planning and cost allocation and generator interconnection.

IV. What FERC Should Be Thinking About: Competition, Done Well, Works

Competitive procurement not only can work, but it does. Five of the six RTOs have conducted more than one successful competitive transmission procurement: The California ISO has selected at least 10 projects by competitive procurement, and the New York ISO a couple. The Southwest Power Pool (SPP) and Midcontinent Independent System Operator (MISO) have implemented successful competitive procurements. SPP recently selected NextEra's $55 million bid for a competitive project in Oklahoma for a 48-mile 345 kV line — the fourth time SPP used competitive solicitations to implement its transmission planning process. Losing SPP bids in this procurement ranged from $74 million to $97 million.[23] MISO has fully completed and energized a 31-mile 345 kV transmission line running from Indiana to Kentucky that was selected through a competitive process. The MISO process, like many, builds into the winning project's contract binding cost-containment provisions, including a cost cap and return on equity cap, an equity percentage cap and a schedule guarantee.[24] MISO has selected at least one other project via a competitive process.[25] Between 2013 and 2017, PJM has opened 16 competitive procurements in which 142 projects were awarded. Of the 803 proposals submitted to PJM during this period, 45% of those proposals came from non-incumbents.

There has indisputably been some success in some regions with competitive procurement.[26] Both incumbents and non-incumbents (e.g., competitive companies) have won projects in all RTOs with the exception of ISO-New England (ISO-NE). This is also means that ratepayers benefit, because competition tends to drive down costs[27] — with some commentators finding cost savings from competitive procurements in the range of

[23] Howland, E. (2022, April 27). Could NextEra's $55M winning bid for SPP's transmission project be among the last of its kind? *Utility Dive*. https://www.utilitydive.com/news/southwest-power-pool-spp-nextera-transmission-FERC/622769/

[24] Khalid, U. (2020, June 11). 1st MISO transmission project awarded through competition completed. *S&P Global Market Intelligence.* https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/1st-miso-transmission-project-awarded-through-competition-completed-59019704

[25] Khalid, 2020.

[26] Joskow, P. (2019, March). *Competition for electric transmission projects in the U.S.: FERC Order 1000*, pp. 33-49. MIT Center for Energy and Environmental Policy Research, Working Paper Series. https://ceepr.mit.edu/workingpaper/competition-for-electric-transmission-projects-in-the-u-s-ferc-order-1000/

[27] The Brattle Group's analysis of transmission procurements indicates that cost reductions of 30% result from open competitive procurements. Pfeifenberger, J., Chang, J., Sheilendranath, A., Hagerty, M., Levin, S. & Jiang, W. (2019, April). *Cost savings offered by competition in electric transmission, experience to date and the potential for additional customer value*. The Brattle Group. https://www.brattle.com/wp-content/uploads/2021/05/16726_cost_savings_offered_by_competition_in_electric_transmission.pdf

20–30% cost reduction.[28] This experience with 10 years of procurements under FERC Order 1000 suggests that, when well implemented, competitive transmission procurements can produce competitive results and drive prices down and facilitate transmission innovation.

The implementation of Texas's Competitive Resource Energy Zone (CREZ) initiative is another proof that competitive initiatives can produce cost-effective transmission results. In 2005, the Texas legislature and then-Governor Rick Perry mandated the CREZ initiative. The Public Utility Commission of Texas (PUCT) implemented the program, which included creation of CREZ zones, designation of transmission types and transmission service providers (TSPs) competitively selected for each zone, with authorization of TSP tariffs. The PUCT adopted rules and standards to ensure that ratepayers' investment in CREZ transmission would be used by multiple wind developers. Texas demonstrated that coordinated planning implemented through a series of competitive procurements for transmission works. Through CREZ, the PUCT and ERCOT connected wind-rich sections of Texas with the state's load centers.[29]

Wind turbines in a rural West Texas field

[28] Commentators as disparate as the Harvard Electricity Law Initiative (HELI) and the R Street Institute agree that competition in the transmission realm is *far too weak*. R Street writes in its comments that "transmission may be the only domain where incumbent cost-of-service utilities often roam free of economic regulation that is supposed to serve as a surrogate for competition. Given the lack of competition and economic regulatory oversight, poor economic discipline results." (R Street Institute. [2021, October 12]. Comments in FERC Docket RM21-17, p. 15.) The HELI writes "the Commission should adapt competitive processes so they facilitate innovation and foster beneficial investments." (HELI. [2021, November 30]. Comments in FERC Docket RM21-17, p. 1.)

[29] See, e.g., PUCT, Electric Substantive Rules, §25.174.

While the transmission buildout expense cost billions,[30] Texas was able to exploit its strong wind resources in remote areas of the state to interconnect massive amounts of land-based wind. Texas's successful procurements provide a clear example of success for competitive transmission development.

On the other hand, competition does not work well if the competitive mandate is implemented poorly, with too many holes, or in bad faith. ISO-NE's Order 1000 program is an example of poor implementation, where the immediate need exception eats the rule (see text box on p. 18). The Harvard Energy Law Initiative (HELI) calls out ISO-NE for its use of immediate need projects to subvert both the planning and competitive mandates of FERC Order 1000:

> For wires-only utilities, the ISO-NE planning process illustrates how current planning rules facilitate undue discrimination. While more than two-thirds of the region's transmission investment post-Order No. 1000 compliance has been approved through the RTO-administered process, all but one project was exempt from competition based on ISO-NE's carve-out for time-sensitive projects ... planning only for immediate needs demonstrates that the ISO-NE planning process is broken. Avoiding urgently needed transmission should be a hallmark of effective planning. Regardless of whether Public Utilities are intentionally manufacturing immediate needs by withholding information or through some other strategy designed to eliminate competitive development, the Commission should recognize that status quo benefits incumbents, is unproductive, and must be remedied.[31]

In putting forth a 20-year (minimum) transmission planning requirement with mandatory scenarios and incorporation of federal, state, and local policy, the FERC transmission NOPR[32] would do much to remedy the planning deficiency noted: basing projects predominantly on short-timing immediate needs to subvert the FERC Order 1000 competitive procurement requirement. But to be effective, the minimum 20-year planning horizon with mandatory scenarios and "best available data" could be further guided by making mandatory the planning models and guidelines for production cost modeling, grid-power transfer modeling, examination of increased regional intertie transfer capacity, and common sources of model input information from reliable government and industry sources such as the U.S. Energy Information Administration published energy price

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[30] The PUCT viewed its role "to minimize risk customers that they may have to pay rates that would support the costs of unneeded facilities." See PUCT, Docket 37567, order on October 8, 2009, adopting amendments to §25.174 as approved at the open meeting in proceeding to establish policy related to excess development in competitive renewable energy zones. Also see PUCT, Docket 37567, Commission staff petition on July 30, 2010, for determination of financial commitment for the Panhandle A and Panhandle B competitive renewable energy zones.

[31] HELI, 2021.

[32] FERC, 2022b.

futures. The FERC transmission NOPR goes a long way in this direction.[33]

Once the planning process is fixed, the experience in the multiple RTOs suggests that competitive procurements will result in more transparent and efficient transmission procurements with customer bill reductions compared to the status quo process. In fact, FERC's commendable emphasis on the next step after the planning process is fixed — transparency of selection criteria[34] — is furthered by arms-length competitive procurements with selection criteria laid out beforehand and evenly applied.

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V. What Else FERC Should Be Thinking About: Transmission for Offshore Wind

As our European colleagues have seen before us, transmission expansion is no longer a land-based endeavor. With 32,000 MW of offshore wind (OSW) mandated in the Atlantic and another 5,000 MW by California, integrating significant offshore generation into our shore-based grids is clearly a task before us. The magnitude of wind now mandated and being planned in waters from Maryland to Maine is significantly higher than New England's average daily power demand (and roughly equivalent to ISO-NE peak demand). Against the backdrop of 32 GW of OSW being planned with some under construction, it easy to recall that development of transmission for offshore wind was a literal blank slate until several years ago. New York's and Massachusetts's initial OSW projects are now starting to fill that blank slate, but that is happening in an extremely inefficient manner.

The current OSW transmission course of development is individual project-by-project generator lead lines connecting to limited onshore POIs. It is already becoming clear that existing onshore POI capacity will be exhausted shortly. Because some coastal areas have weak transmission and because onshore transmission capacity is so limited compared to the amount of mandated OSW (and even greater amounts of other renewables), this short-sighted initial build-out will lead to more expensive total grid integration costs in future. A Tufts University School of Engineering study examines existing shore-based points of interconnection for capacity as well on the grid along the Northeastern U.S. coast and concludes that without immediate efforts to coordinate transmission upgrades and

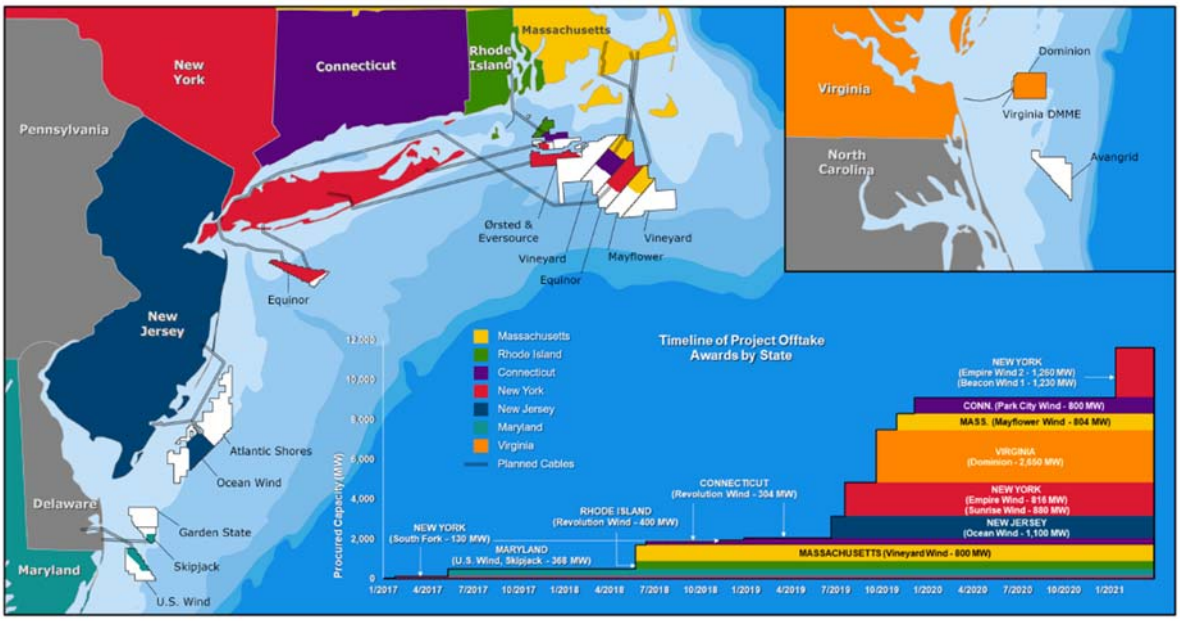
[33] FERC, 2022b.

[34] FERC, 2022b.

maximize interconnection capacity, the U.S. OSW industry will hit a transmission capacity wall:

> . . . the U.S. offshore wind industry will quickly encounter limits to build-out capacity if interregional efforts to coordinate land-based transmission upgrades and maximize POI effectiveness are not engaged immediately.[35]

Figure 2: Procurements Awarded from U.S. Atlantic Bureau of Energy Management Wind Energy Areas



Source: Tufts University Offshore Power Research & Education Collaborative

In short, the projects and interconnections approved to date ignore the potential long-term efficiencies of a more robust set of offshore interconnections. As a result, the existing interconnection capacity of shore-based POIs usable for OSW is to some extent being squandered in connecting only a single wind farm each, whereas a more networked solution to meet the mandated state targets, one that optimizes use of existing shore-based POIs, is nowhere under federal consideration. Beyond that optimization between onshore and offshore transmission, there are other best practices that could reap reliability benefits for an offshore grid: potential parallel facilities, looped circuits among offshore collectors, substations, and interconnections to multiple offshore wind farms. These ideas so far have received very little attention from RTOs or FERC.

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[35] Smith, K., Lenney, S., Marsden, O., Kates-Garnick, B., Stankovic, A. & Hines, E. (2021, February). *Offshore wind transmission and grid interconnection across U.S. Northeast markets*. Tufts University Offshore Power Research & Education Collaborative. https://dl.tufts.edu/concern/pdfs/47429p92q. See also U.S. Department of Energy. (2021, October). *Atlantic offshore wind transmission literature review and gaps analysis*. Office of Energy Efficiency and Renewable Energy Wind Energy Technologies Office. https://www.energy.gov/sites/default/files/2021-10/atlantic-offshore-wind-transmission-literature-review-gaps-analysis.pdf

The need for federal planning of transmission for OSW should not become dire before offshore transmission receives the same level of attention as onshore transmission.

The need for federal planning of transmission for OSW should not become dire before offshore transmission receives the same level of attention as onshore transmission.[36] And if no existing RTO pays sufficient attention to transmission from OSW to serve its customers, then perhaps a single federally regulated RTO or transmission operator/organization should be created by FERC for OSW transmission on each U.S. coast, which would allow for focused and transparent oversight of planning, interconnection, and cost allocations for these OSW facilities.

VI. What FERC Can Do to Drive Effective Implementation: Oversight

FERC is far too busy, and far too understaffed, for the magnitude of its transmission responsibility, to oversee whether and how RTO/ISOs and transmission operators are processing thousands of interconnection requests, not to mention overseeing transmission planning nationwide.[37] Not only do the numbers suggest FERC cannot effectively oversee the interconnection process, but the process suggests that interconnecting customers may not propose new technologies or approaches, contest unreasonable applicable of general standards, or appeal unreasonable outcomes at all. This is because ultimately the interconnecting customer needs the transmission operator/authority or RTO to grant approval, which means that challenging the operator's decisions on appeal will lead to delays and, possibly, regulatory litigation rather than expeditious development of the project. Tying up development capital and resources in a cutting-edge proposal or legal dispute is not a good customer business model for competitive companies.

How might FERC ensure that transmission organizations are following its new rules? One

[36] In comments to FERC, Massachusetts Attorney General Maura Healey urges a multi-decade regional approach to transmission planning, observing that: "Project-specific transmission might be lowest cost (and lowest risk) for individual projects but this form of *ad hoc* or accretive transmission development is likely neither least-cost for consumers overall nor least-impact for the public generally. . . due to vagaries of queue positions and ISO-NE impact study determinations . . . the first MW of interconnected offshore wind per MW offshore wind interconnection costs have been forecasted to increase from $9,626/MW to $833,000/MW, an 86-fold increase." Healey. M. (2021, October 12). Initial comments from Massachusetts Attorney General's Office. FERC Docket RM21-17.

[37] Or, in the absence of such an entity, there are more limited routes to address these concerns within the planning and interconnection NOPRs. One such route is a required annual filing on interconnection processes and implementation of the interconnection NOPR and a parallel required annual filing on the transmission planning process with any failures to meet minimum timing or other procedures and study requirements required to be identified. Such reports may be helpful but far less helpful to the Commission that an independent transmission monitor.

attractive solution is to establish an independent transmission monitoring (ITM) entity.[38] Either two ITMs covering the Eastern and Western Interconnections or a single national ITM, in either case reporting to FERC, would be a workable model for oversight: national consistency and an interregional view to benefits suggests a broader than single-RTO perspective to transmission oversight would benefit FERC in implementing these reforms. That said, there is a parallel to Independent Market Monitors (IMMs), which do not enforce and ensure adherence to market rules but do report to RTOs, FERC and market participants, and have the ability to file separate recommendations with FERC in some regions. An ITM could make recommendations on interconnection and planning standards, which would then be subject to FERC approval after notice and hearing (thereby protecting the rights of affected parties). An ITM or ITMs could audit compliance with those standards as well as review compliance filings. A FERC-authorized transmission oversight entity could work the same way, subject to FERC approvals for its actions and FERC authority to audit and to require compliance with FERC directives. Any substantial disputes would go back to FERC for resolution.

FERC should adopt a transmission oversight structure for overseeing transmission planning and interconnection. An entity with oversight of these functions and the RTOs, with the ability to audit RTOs for following planning and modelling mandates and interconnection process and queues, could be very valuable. Effective regulation requires effective oversight of FERC's guidelines and mandates to assist FERC on transmission planning and interconnection implementation. Such as entity would assist FERC in doing what the commission does not have bandwidth to do on its own. Just the act of auditing can be very valuable to encouraging compliance.

VII. What FERC Knows: If It Is Not Mandatory, It Will Not Happen

FERC has proposed excellent planning standards for new long-term planning and scenarios to provide potential symmetry and consistency in approaches nationwide. Experience pre- and post-FERC Order 1000 strongly suggests that making transmission planning mandatory (as it has proposed) is the only way route to implement planning standards fully and well.

FERC Order 1000 mandated competitive procurements and consideration of state policies in transmission. But Order 1000 did not mandate that RTOs run those transmission

[38] A national transmission authority would be ideal from some perspectives if properly staffed and funded. But since the United States does not have a tradition of national-level direct transmission regulation (unlike the United Kingdom, for example), establishing a national-level oversight body with regulatory power would be a major undertaking.

procurements consistent with state energy policies; rather, it was encouraged. Further, while there is an understandable reluctance for FERC, a federal agency, to order states to do things,[39] it is worth remembering that FERC orders are mandates on RTOs, not states.

RTOs and ISOs are creatures of FERC — federally regulated utilities created by FERC with federally granted monopolies on bulk transmission operation, planning, wholesale market operation, and interconnection of generation and other resources. For that reason, there should be no reluctance for FERC to mandate planning, funding, and state policy integration. In non-RTO regions, the same standards would apply to utility operators to ensure equal treatment across the United States.

So a light touch for states but mandatory requirements for RTOs and transmission operations is consistent with the law, good policy and good sense. FERC can facilitate oversight by requiring consistent best practices and approaches to modeling. By this we mean approaches that use approved models, assumptions and data from reliable official and industry sources, specific interregional standards for opening up transfer capacities, and scenarios with certain types and amounts of pending queue requests approved. The modeling needs to involve analysis that is well thought out and will result in robust modeled results, useful for considering varied scenarios. Transmission planning needs to be transparent and replicable by the public, including interested parties, stakeholders, and researchers, using a similar set of tools. Just as scientific findings need to be published and replicable by other scientists to show the results are correct, so too should transmission models build on solid sets of accepted data, assumptions and methodologies. But that can only be ensured if models, data sources and assumptions are to some extent mandatory and transparent.

Interregional planning requirements, to consider investments that can open up transmission benefits of inter-regional transfer capacity, should be mandatory as well. Inter-regional planning and projects can yield substantial energy and capacity savings for consumers and have not received the attention Order 1000 envisioned. There are benefits to reliability (see the challenging Texas winter of 2020-21), energy pricing, capacity, and other efficiency gains from considering the Eastern and Western Interconnections more as a single grid than a collection of individual grids with tolls, barriers, and traffic lights at key intertie locations.

[39] There are multiple legal, political and practical reasons why FERC may want to take a light touch with states: states have their own utility and energy regulators; states have their own policies, laws and initiatives, and states have certain authorities preserved under the Federal Power Act.

ISO-New England's Order 1000 Procurement Illustrates Why Mandates Are Necessary for RTOs

In the 11 years since FERC Order 1000 was put in place, ISO-NE conducted a single competitive procurement only just recently — a decade after the FERC mandate. In its Order 1000 implementation process, ISO-NE adopted an exception for "immediate need reliability" projects, which FERC declined to overturn as unjust and unreasonable,[40] but this exception has swallowed the rule. Regular use of this "immediate need reliability" exception has meant that ISO-NE has fit most transmission upgrades, worth billions of dollars,[41] through this exception to effectively avoid the FERC Order 1000 competitive procurement mandate.[42]

While the use of an exception to defeat a mandate is problematic in itself, even more problematic is the failure to consider the transmission needs of offshore wind in the lone ISO-NE competitive procurement, which sought bids for an interconnection upgrade to compensate for the closure of the Mystic generating station in Massachusetts. The Mystic station was located at an important transmission node (a grid location with substantial switch and transformation) serving Boston. Renewables in general are a significant priority for all six New England states; multiple procurements, pursuant to state policy, have taken place and the states have substantial renewable goals. Some of the Mystic bidders took the opportunity to innovate and submitted bids that solved the reliability issue in a manner that solves for future renewable interconnections. In short, competitive bidders innovated to meet future and current needs.

While FERC Order 1000 was intended to encourage RTOs to plan to accommodate state policies and while the northeast states from Maryland to Maine have mandated 32 GWs[43] of OSW and more renewables yet to be procured, ISO-NE failed to incorporate solutions to cost-effectively integrate OSW. This Mystic transmission upgrade was and is a perfect spot for upgrades to facilitate integration of large quantities of renewables via marine transmission. The bids referenced above offered "future proofing" and "multi-value" bid solutions to address short-term reliability issues as well as state-mandated clean energy goals.

But ISO-NE did not future-proof the New England grid, nor did it even consider these state mandates or the most efficient system solutions for the ISO and state grid needs. While ISO-NE does not mention the exclusion of state clean energy mandates nor its summary dismissal of all but one bid in its press release,[44] the failure to incorporate state policy and real competitive procurements is salient.[45] FERC also did not hardwire the integration of state policies with RTO planning and procurements in Order 1000. And FERC does not have the resources to review every one of the 30 transmission projects that ISO-NE shoe-horned into the "immediate need exemption" over 10 years. The Mystic procurement demonstrates how FERC guidelines can be deformed in practice. Experiences like this with Order 1000 demonstrate that a mandate and an oversight process are necessary to implement FERC reforms. The lesson is clear: If best practice from FERC is not made mandatory for an RTO, it does not matter in practice.

If the modeling and planning guidelines are advisory on the RTO, they will be followed sometimes in the best of worlds. Both the transmission NOPR and the interconnection NOPR requirements need to be mandatory to be followed.

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[40] FERC. Docket EL 19-90-000, 171 FERC ¶ 61,211. Order issued June 18, 2020, on Section 206 Investigation of ISO New England Inc. Also see comments filed in this docket by a group of New England agencies: the Connecticut Attorney General, Massachusetts Attorney General, Connecticut Department of Energy and Environmental Protection, Connecticut Office of Consumer Counsel, and the Maine Office of Public Advocate. https://portal.ct.gov/-/media/AG/Press_Releases/2019/Comments-of-New-England-Agencies.pdf?la=en

[41] The 2021 ISO-NE Regional System Plan notes more than $11 billion of system projects placed in service since 2002, with more than $1 billion more planned.

VIII. Conclusion

FERC has proposed practical interconnection reforms based largely on models already in place and tested in certain regions. Updated interconnection standards are sorely needed to meet the needs and realize the capabilities of newer energy resources seeking to interconnect to the grid. FERC should move quickly to adopt these tested reforms, and it should put in place an oversight entity for interconnection and transmission planning.

FERC has proposed transmission planning reforms, which are well-conceived and should be adopted too. But the commission needs to ensure its reforms do actually "take." The transmission planning, modeling, and scenarios guidelines need to be mandatory to obviate poor implementation. States deserve some amount of FERC deference, but RTOs do not: They are creatures of orders for which FERC is entirely responsible. In non-RTO regions, the same standards would apply to utility operators to ensure equal treatment across the United States. Similarly, to the above recommendation, FERC should create an oversight entity structure for interconnection and transmission planning, to help the Commission do what it currently does not have the capacity to do.

[42] ISO-NE has placed over 30 completed and ongoing projects into this "immediate need reliability" exemption. See comments of New England agencies in FERC Docket EL 19-90-000.

[43] For comparison, these OSW mandates equal roughly the entire generation capacity of ISO-NE.

[44] ISO Newswire. (2020, July 24). *ISO-NE makes selection in first Order 1000 transmission RFP*. https://isonewswire.com/2020/07/24/iso-ne-makes-selection-in-first-order-1000-transmission-rfp/

[45] Commentators, including the HELI, have laid out how the various RTO and utility processes have changed under FERC Order 1000 to avoid the competitive mandate and fail to undertake long-term planning.

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