

National Transmission Needs Study Draft

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April 20, 2023

The Law of the Instrument is a cognitive bias that is often expressed with the phrase, "If the only tool you have is a hammer, every problem looks like a nail." The draft National Transmission Needs Study epitomizes the Law of the Instrument because it prioritizes transmission as the only possible solution. Three years ago, DOE's last congestion study concluded, "...the Department has not identified transmission congestion conditions that would merit proposing the designation of National Corridors."¹ Now the Department has found terrible congestion in an area so vast that if the DOE were to designate corridors to solve it, the entire continental U.S. would be one gigantic "corridor." The only conclusion that can be drawn by these drastically different findings is that the DOE's transmission studies are not based on data and science, but on political goals. This does not benefit the citizens the Department exists to serve. Although politics produces a vast supply of hot air, it cannot keep the lights on.

The National Transmission Planning Study ("Study") relies on cherry-picked studies funded by special interests to make its findings. FERC's "Report on barriers and opportunities for high voltage transmission"² that the DOE relied upon for its Study was also created using special interest studies and not upon any information from or about the human barriers themselves. Although landowner concerns about new transmission easements across their properties is mentioned in DOE's Study, no one thought to consult these "barriers" to find workable solutions. It is interesting to note, but not surprising, that DOE's Technical Review Committee does not include any actual landowner representatives. The citizens who would bear the brunt of new transmission's devastating impacts have been barred from meaningful participation in this Study.

Perhaps the biggest failing of this report is its quick dismissal of co-locating new high-voltage electric transmission on existing federal highway rights-of-way, or other transportation corridors. The study uses old information and tired excuses to brush aside the best chance for successfully building new transmission today. The study incorrectly claims that, "high voltage lines can also affect railroad signaling systems" but fails to recognize transmission projects such as SOO Green HVDC Link,³ which is proposed to be buried on existing railroad right-of-way for hundreds of miles. If it would cause issues with signaling, would Canadian Pacific be a willing partner on this project? The Study's findings just don't make sense. Another excuse used by the Study is "electrical interference can affect the protection systems of oil and gas pipelines and accelerate corrosion," which is another "problem" that has been solved by modern technology.

¹ National Electric Transmission Congestion Study, page vi, September 2020.

² FERC. 2020. Report on barriers and opportunities for high voltage transmission. Washington, DC: Federal Energy Regulatory Commission.

<https://www.congress.gov/116/meeting/house/111020/documents/HHRG-116-II06-20200922-SD003.pdf>.

³ <https://soogreen.com/>

Selecting another corridor easily solves the claim that transportation corridors may not run in a direction compatible with the project. It's not as if there's a shortage of transportation corridors running in any direction. The idea that co-location can cause safety concerns is entirely solved by burying the transmission in a shallow trench on the edge of the highway right-of-way. We've been burying utilities alongside transportation corridors for decades and I haven't seen one report of a buried line jumping out of the ground to cause an accident. Security would actually be increased if electric transmission was buried alongside busy transportation corridors, instead of strung on metal towers across remote locations. Any and all excuses against an effort to use existing linear infrastructure corridors for siting new infrastructure can be easily dispelled with up-to-date studies and a will to implement the latest technology. A better place to get modern information and recent studies on co-locating transmission on transportation corridors can be found at The Ray.⁴ The current administration has ordered that the use of highway corridors to site new electric transmission be encouraged,⁵ therefore DOE would be remiss if it did not give adequate consideration to this policy and put its full effort toward accomplishing this goal.

The Study notes, "Transmission projects also frequently face public opposition or "not-in-my-backyard" concerns for various reasons. These challenges can lead to increased costs, schedule delays, or even project cancellations."⁶ But yet the Study plows ahead without any practical solution to this dilemma. Perhaps DOE personnel concocting this Study lack the awareness and empathy simply because it is not *their* "backyard." The DOE also seems to be unaware that dismissing opposition to transmission using derogatory motives for opponents like "not-in-my-backyard" is name-calling at its worst. The only way to solve these "NIMBY" challenges is by siting new transmission buried on existing transportation corridors, which are not in anyone's "backyard."

The Study has an impossible goal to eliminate all transmission congestion. Transmission congestion can never be completely eliminated; it can only be shifted from place to place. Relieving economic congestion attempts to levelize prices between different geographic areas. Like a seesaw, the lowering of prices in one area raises them in others. An area with adequate, competitive generation enjoys the benefits of that competition with lower electric prices, while an area without enough competitive generators pays higher prices. It's simple supply and demand, which is something the DOE can never "fix", nor should it even try. There is more than one solution for economic congestion. New generation in high priced load pockets can also solve economic congestion but is ignored in the Study because of DOE's Law of the Instrument approach. Congestion that is "solved" with new transmission before competitive generation markets can work to incite the building of new generation is a market failure. High electricity prices are a demand for new generation, not just transmission.

⁴ <https://theray.org/technology/transmission/>

⁵ <https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/27/fact-sheet-biden-administration-advances-expansion-modernization-of-the-electric-grid/>

⁶ Draft Study at page 9.

The Study used the following example to tout the value of transmission, “During the Texas heat wave of 2019, the study found that an additional 1 GW transmission tie to the Southeast could have saved Texas consumers nearly \$75 million.”⁷ However, it fails to note how much constructing that transmission tie would cost consumers. Based on the huge costs of constructing new transmission, it is likely that the cost of the tie would be a lot more than the \$75 million. How many heat wave events would be needed before the new transmission tie actually saved consumers money? Would new peaking generation in Texas actually cost less? This is more an example of the Study’s Law of the Instrument thinking than a demonstration of the value of new transmission.

The idea that we can expand the transmission system so that every electron generated anywhere can be used by anyone is not only prohibitively expensive, it is patently absurd. A true apples-to-apples comparison of the cost of new transmission vs. the cost of new generation near load is avoided in the Study. This comparison must be made before saddling consumers with new transmission costs to connect with remote generators. It is more likely that transmission is not cost-effective, even with vague claims of “economies of scale” factored in. What are the “economies of scale”, exactly, and how are they calculated? The report doesn’t say. It seems like this term is used to avoid true scientific study.

An inability to import generation from other regions cannot always be solved with new transmission when the excess generation is just not there in the other regions. If a region without adequate generation (or variable generation that cannot reliably serve load) can “borrow” from other regions using new transmission, what happens when the neighboring regions also lack sufficient generation? Insufficient generation events are spreading across the country. Soon, no region may have sufficient generation, or enough to share with others. Placing average capacity factors on a spreadsheet to determine that “there’s always power to be had somewhere” only works on paper. In real time, capacity factors can tank over a wide area all at once, such as overnight, when solar is not producing. Transmission does not produce electricity. Only generators can do that, and they must be reliable all the time, not just some of the time at the whim of Mother Nature. As bulk power system reliability engineer George Loehr once testified, “Reliability is not a function of the amount of wire in the air.”⁸

The Study touts bidirectional trading of power between regions, but does not recognize the nature of interregional merchant transmission, where dedicated capacity is sold to generators and/or load serving entities. Merchant transmission is paid for by contracted customers, not captive ratepayers. If merchant transmission does not have firm customers, it has no revenue stream and is uneconomic to build. If an eastern load serving entity has purchased dedicated capacity on a merchant transmission line to serve its load from contracted generators in other regions, how could this capacity be commandeered to reverse flow when needed? The eastern city may not be able to serve its load that depends on the power imports. The city would have to offer its capacity for re-sale in order for others to use it. Bidirectional power trading between regions depends

⁷ Study at page 71.

⁸ Testimony available at <https://earthjustice.org/wp-content/uploads/loehr-testimony.pdf>

on the availability of capacity. The Study needs to explore this concept further and explain exactly how this would work. If it does, would it discourage load-serving entities from purchasing merchant transmission capacity to serve load if that capacity could suddenly become unavailable? Why would anyone purchase something that can be taken from them at any time without repercussion?

The DOE has not sufficiently answered the question of its authority and jurisdiction to plan the transmission system. The idea that DOE's Study could help inform and drive planning at regional transmission organizations is perhaps a bit ambitious and naive. Regional transmission planners use their own data and assumptions to plan their systems to meet reliability standards and projected demand growth, or to solve necessary historic congestion within their region. They have been doing this for decades and it is questionable whether or not they need help from the Department of Energy to perform a job they seem rather capable of doing. The Study creates a completely separate and ambitious plan to build transmission, whether it is actually needed by RTO planning criteria or not. The DOE Study is not bound by reliability standards, instead it seems to be focused on political goals. As a consumer, I'd much rather have experienced engineers and planners keeping my lights on, instead of a bunch of policy wonks planning the grid to meet the goals of people who have no idea how it works. DOE does not have authority to plan the transmission system, or allocate the costs of transmission to consumers in the corridors it designates. Those are responsibilities of existing planning authorities. DOE only has authority to designate corridors that shift transmission permitting from states to federal regulators. If DOE's Study is even remotely useful for transmission planning, why are we paying billions of dollars every year for the planning services of RTOs? It seems like DOE is duplicating the efforts of others by usurping their authority to plan the transmission system and allocate costs to captive ratepayers. System reliability, resilience, and congestion relief are the reasons DOE gives for the necessity of all the new transmission in its Study, however existing planning authorities already have that covered.

The Study relies too much on the number of generation projects in interconnection queues without the realization that only a small fraction of these projects are ever built. Until interconnection agreements are signed, the projects in the queue are nothing more than ideas. A transmission system built to allow the interconnection of all projects in the queue is an overbuilt and unnecessary transmission system.

The Study's data is inaccurate by presuming all congestion can be solved with new transmission. For instance, the Study found that congestion in PJM could be solved by new transmission, such as the Independence Energy Connection (IEC) in Pennsylvania and Maryland, a project that was proposed more than 5 years ago by PJM to solve economic congestion in the Washington/Baltimore metro area. The Pennsylvania PUC has subsequently rejected IEC because it is too costly to the state's electric consumers. The historic congestion that was the basis for this project has evaporated. DOE breathing new life into this project with a corridor designation is a complete waste of consumer dollars. New congestion in PJM is caused by temporary outages due to transmission work. DOE could not have actually studied the facts of this congestion before deciding

that new transmission to alleviate it should be built. The IEC project would open new avenues for cheap coal and gas-fired generation from the Ohio Valley to reach Washington and Baltimore. This new generation would supposedly lower electric prices; making planned renewable projects closer to load uncompetitive and uneconomic to build. This hardly helps the renewable transition that supposedly underlies everything in DOE's Study. Without the IEC, Washington and Baltimore would build new renewable generators that are economic. With IEC, they would continue to rely on fossil-fuel generators in other states. Building transmission to levelize prices within a region, or between regions, does not always result in less carbon emissions.

The Study posits that additional long-distance transmission can act as insurance against weather-related blackouts. Aboveground transmission lines strung through remote areas only adds risk to the system from wildfires, hurricanes, tornados, sabotage and other grid failure events. A smaller system where load and generation are closer together decreases risk simply because there are less points of possible failure. Only buried transmission can protect against these types of outages because it is not exposed to weather and opportunity for destruction. If we're going to make progress in this country we must stop using transmission technology from the 1880's: aerial wires strung on invasive metal structures. Why not spend some of the money dedicated to improving our energy systems on modernizing transmission so that it doesn't cause burden, doesn't take private property, and doesn't foment loud and long opposition?

Transmission opposition to aerial projects on new rights-of-way will definitely happen. It can delay actually building transmission for decades, and will certainly increase its cost. The Study notes, "Large amounts of low-cost generation potential exist in the middle of the country and accessing this generation through increased transmission is cost effective for neighboring regions." This "low-cost" generation is only low-cost because it relies on taxpayer-funded subsidies and because it has "...prioritized placement in low-cost lands"⁹. The Study admits, "...high cumulative burden should be an indicator to avoid those areas."¹⁰ Midwestern landowners and farm businesses are already losing vast amounts of land from numerous energy-related projects such as liquid petroleum, natural gas, anhydrous ammonia, crude oil, highly volatile liquids and CO2 pipelines. They are also being surrounded by wind and solar "farms" (a term at which real farmers scoff). Just because turning rural America into an energy serfdom to provide power to far-away cities who don't want to build all that nasty infrastructure in their own backyard is "cost effective" for the cities doesn't mean rural areas should be turned into the nation's powerhouse. This smacks of cultural and political elitism. Building long distance transmission means you don't have to build new generation in your own neighborhood.

The DOE's Law of the Instrument Study makes several findings that suit its pre-determined agenda, such as:

⁹ Study at page 41.

¹⁰ *Id*

“Because generation resources are usually located far from load centers, transmission infrastructure is required to connect those resources to the larger system.” and “New transmission advances clean energy goals by enabling greater access to clean energy resources, which can be in remote areas, far from load and the existing transmission system.” Clean generation can be everywhere and anywhere if there is the will to do it. It’s just not true that generation has to be located far from load and the existing transmission system. Before destroying the American farm industry that supplies our food, we need to put on our thinking caps and revolutionize the way we produce and deliver energy.

Perhaps this much-ignored passage from the Study is a place to start:

“There are several different combinations of solutions to meet regional electricity demands, for example, co-locating generation and storage units, [or] siting generation close to load...” Another idea is to site new nuclear generation at shuttered fossil fuel power plants that already have sufficient transmission to serve local or regional load. The Study does not “...make the least cost choice among these combinations.” It does nothing more than provide a not-very-believable backstory for a political choice the DOE seems to have already made. Transmission is a band-aid being used to hide the fact that intermittent renewables alone cannot power our country. How much money will be wasted before we are finally forced to admit it? And will it be too late?

When the only tool you have is a hammer, everything looks like a nail.