



April 20, 2023

U.S. Department of Energy
Grid Deployment Office
1000 Independence Ave., SW
Washington, DC 20585

RE: Comments on Draft 2023 National Transmission Needs Study

Submitted via: needsstudy.comments@hq.doe.gov

To whom it may concern:

The National Electrical Manufacturers Association (“NEMA”) submits the following comments in general support of the Department of Energy’s (“DOE”) draft *National Transmission Needs Study* (“Study”). As our organization has voiced in previous editions of this study (formerly known as the *National Electric Transmission Congestion Study*),¹ we believe such exercises prove useful for all parties involved in transmission development to properly identify and frame the challenges to the buildout of this vital grid component. Further, with the recent historic investments in clean energy through the Infrastructure Investment and Jobs Act (“IIJA”) and the Inflation Reduction Act (“IRA”) on both the demand and supply sides of the electric grid, the Study is timely and can help ensure that the benefits sought through electrification are maximized.

NEMA represents nearly 325 electrical equipment and medical imaging manufacturers that make safe, reliable, and efficient products serving building systems, building infrastructure, lighting systems, industrial products and systems, utility products and systems, transportation systems, and medical imaging. Our combined industries account for roughly 370,000 American jobs in more than 6,100 facilities located in every state. These industries produce \$124 billion in shipments and \$42 billion in exports of electrical equipment and medical imaging technologies per year.

The electroindustry fully understands that the clean energy transition and modern economy cannot be realized without resilient, reliable, and adequate high voltage direct

¹ <https://www.energy.gov/oe/articles/2020-national-electric-transmission-congestion-study>

current (“HVDC”) transmission investment. NEMA supports processes which makes HVDC more plentiful, including through the application of grid enhancing technologies which make existing lines ‘smarter’ and more efficient to physical upgrades to components, such as updating wire cores from steel to composite. Modernization of existing HVDC lines alone, however, will only produce marginal benefits for the grid as a whole. The development and installation of new HVDC transmission lines in the near-term and throughout the country is necessary for this transition to be holistically successful.

Therefore, NEMA has aligned with other organizations to encourage DOE, the Federal Energy Regulatory Commission (“FERC”), and other relevant agencies to bring fresh and creative perspective and insight to how transmission projects can progress in fair, efficient, and effective ways. These coalition partners include the Rail Electrification Council (“REC”) and NextGen Highways to encourage and incentivize the use of existing rights of ways for transmission siting along railroads and highways. Additionally, NEMA supports the position taken by Americans for a Clean Energy Grid to identify ways for greater cooperation among regional grid interconnections as well as permitting and other institutional reforms necessary for national grid development.

For decades, America’s electroindustry has been an active participant in the development and deployment of innovative and reliable grid products across the transmission spectrum. In many ways, the nation’s current electric grid exists due to the enabling strategies made capable by these technologies. As transmission developers, siting authorities, regulatory agencies, and other interested parties consider how best to address transmission needs, it is important they consult with manufacturers to better understand the art-of-the-possible which current technologies can offer.

The Study defines an electric transmission need as the “present or expected electric transmission capacity constraints or congestion in a geographic area.”² Furthermore, “geographic areas where a transmission need exists could benefit from an upgraded or new transmission facility—including non-wire alternatives—to improve reliability and resilience of the power system.” NEMA appreciates DOE’s continued acknowledgment that there is not one need regarding transmission and, therefore, not a one-size-fits-all solution to satisfy those needs. The current and future energy requirements of the thirteen geographic regions identified in the Study vary due to a variety of factors, including changes in population, topographical barriers, political and cultural norms and traditions, property rights, and other market- and policy-based issues. Thus, the answers to a region’s electric energy needs will rely on a blend of cooperation, opportunity, creativity, and technological prowess.

² <https://www.energy.gov/sites/default/files/2023-02/022423-DRAFTNeedsStudyforPublicComment.pdf>

Just as the Study is neutral in its analysis and simply identifies the needs of each region based on DOE's review of publicly available data and industry studies, NEMA wishes to generally emphasize available technological opportunities and recommend potential policy considerations which could help address those needs.

Technological Opportunities

- Continued Consideration and Adoption of Grid Enhancement / Dynamic Line Rating Technologies

The needs of the various energy regions and the states within them vary dramatically; investment in new transmission lines and infrastructure alone will not solve their immediate and short-term load needs given the lengthy process to build and implement such projects. Grid enhancement technologies ("GET"), such as dynamic line ratings which enable constant measuring and adjusting of transmission load based on immediate operating conditions, allow current infrastructure to become as efficient as possible. As the Study makes clear, non-wires alternatives need to be considered on par with new transmission investment if the goals of electrification are to be realized and needs adequately met.

Other federal entities have already begun to support these alternatives. To improve the accuracy, transparency, and effectiveness of transmission line ratings, FERC issued Order 881, a policy aimed at maximizing available transmission capacity. The order will require independent system operators, transmission owners, and regional transmission owners to implement ambient-adjusted ratings ("AAR") on the transmission lines over which they provide transmission service. AAR technologies are products which frequently, some hourly, calculate the variables of a transmission line, enabling more timely and accurate information to be relayed to transmission system operators and managers. NEMA encourages DOE to continue encouraging an 'all-of-the-above' philosophy when it comes to grid enhancement technologies as viable solutions to regional transmission needs.

- Grid Component Modernization

The deployment of modernized grid components can effectively bridge many capacity and line-efficiency needs in every energy region. For example, the replacement of legacy steel-core wires with high-temperature, low sag conductors can allow for more power to be pushed through a transmission corridor and over a longer distance. Such products made with composite cores versus steel are able to transport more load capacity with reduced expanding and sagging of the wires themselves. Combine hardware upgrades such as these with the software technologies described above, transmission needs can be met much more quickly.

The IJA provided ample funds for grid resilience and reliability upgrades. As NEMA suggested in its comments to DOE on the implementation of the Grid Resilience and Innovative Partnership (“GRIP”) program last year, a proactive approach to grid resilience planning will help ensure cost effective IJA investment. As envisioned, it will also invite more capital and creativity into this space, allowing for the potential of even greater and more effective solutions to transmission needs.

The GRIP program encourages grid operators to lean into the value of data-driven, automated decision-making technologies; smart tools which further identify risks and opportunities for planning purposes and needs identification. GET, dynamic line ratings systems, stationary battery technologies, distributed energy resource aggregators, and other advanced power flow control devices are proven, innovative tools which have helped the grid modernize. Such technologies likewise serve as a practical bridge between legacy equipment, designed to achieve output goals, and contemporary systems, designed with cybersecurity, digital connectivity, and efficiency in mind.

Policy Considerations

- Utilization of Rights of Way

NEMA advocates strongly for siting authorities on the federal, state, and local levels to encourage the use of rights of ways (“ROWS”) along existing highways, railroads, brownfields, and other corridors for transmission development. The benefits of such utilization are many, particularly for the communities transmission projects are expected to navigate through. Such benefits include minimal or low environmental impact by running alongside, above, or below existing transportation corridors. These avenues already run close to or directly through populated regions which require higher energy loads; utilizing ROWs thereby increases distribution efficiency and reduces property-rights issues. Existing ROWs provide project developers a ready-made option to run new transmission lines.

Providing the correct incentives for owners of ROWs is a necessary component in order for this recommendation to effectively address transmission needs. For example, most railroad ROWs are privately owned, and the industry is already heavily regulated by the Federal Railroad Administration (“FRA”), which sets safety standards and approves rail research and improvement strategies. Collaboration with railroad companies and the FRA along with transmission developers, FERC, the REC, and other interested parties is strongly suggested. Doing so will allow the best incentives to be identified and

encourage these entities to become partners in the electrification of America's economy.³

Highway ROWs provide similar benefits for electrification but require different incentives in order to be utilized for transmission development. Primarily owned by states and managed by state transportation authorities, existing highway ROWs can allow for transmission to be developed with mitigated impact and increased societal benefits. However, many states have dated rule or regulations that currently disallow for transmission development to occur on such corridors, enacted decades before in part because of safety concerns. Modern day grid technologies allow the safe implementation and flow of transmission along highways; modernizing these laws to compliment technological advancements will help provide transmission benefits sooner.

Similar to railroads, greater collaboration and leadership between and among federal agencies can allow for highway ROWs to be utilized more quickly. The DOE, FERC, the Federal Highway Administration ("FHWA"), the Department of Interior, and others all play an important role in the development of this transmission solution. For example, the FHWA allows for highway transmission projects to be given a "utility accommodation" or receive approval as an "alternative use" of the highway ROW to overcome dated statutes. Likewise, in its backstop siting notice of proposed rulemaking,⁴ NEMA and the REC encourage FERC to consider and prioritize ROWs as it considers new authorities in order to advance transmission development.

- Identify Lack of Transformer Ability as a 'Need'

While the Study is mainly concerned with transmission needs, grid development must be looked at in a wholistic way and include variables concerning electricity distribution. The availability of critical products necessary for the grid's functionality at the state and local level, meaning consumer end-users, must be considered as part of transmission planning; the timing and ability to deliver electricity to the end user are paramount when planning future transmission load usage, rate setting, and return on investment.

The Study does mention, albeit as an example, that power flow could be constrained due to the technical limitations of transformers themselves and be a cause of transmission constraint.⁵ This is true; a transformer itself can only step-up or step-down a certain capacity of electricity, based on its technical design. However, the document stops short of identifying that the lack of available transformers is in itself a

³ <https://www.utilitydive.com/news/4-transmission-technologies-to-watch/617945/>

⁴ <https://www.federalregister.gov/documents/2023/01/17/2022-27716/applications-for-permits-to-site-interstate-electric-transmission-facilities>

⁵ <https://www.energy.gov/sites/default/files/2023-02/022423-DRAFTNeedsStudyforPublicComment.pdf>

much greater cause of transmission congestion. NEMA argues that the larger issue confronting transmission development is less the technical limits of a transformer and more the inability to obtain one.

Large power and distribution transformers are key to the grid's distribution operations. Without them, transmission loads have nowhere to go as electricity cannot be delivered to the end user. Production timelines for these products have extended exponentially over the past few years for a variety of reasons. In 2020, the expected delivery time for a distribution transformer once it was ordered was about six months; now it is more than 16 months on average. For large power transformers, the wait time can be as high as 38 months.⁶

DOE conducts transmission needs studies on a triennial basis. If the ability to obtain transformers, or any other grid component, takes roughly half or even longer than the scope of these studies, NEMA argues that this is a significant 'need' which much be considered and presented as a study criterion. NEMA has submitted to DOE numerous comments within the past six months on what policies should be pursued by government in order to help reduce the production timeline of these products.⁷ ⁸ We urge the department to include and acknowledge this situation as part of its final document.

NEMA once again appreciates the opportunity to provide these comments on the Study. If there are questions regarding these comments, please do not hesitate to contact me.

Sincerely,

Spencer Pederson
Vice President, Public Affairs

⁶ <https://www.tdworld.com/utility-business/article/21243198/transformational-times-update-on-the-us-transformer-supply-chain>

⁷ https://www.nema.org/docs/default-source/advocacy-document-library/nema-comments-on-distribution-transformers-nopr-march-27-2023.pdf?sfvrsn=b64b63fe_3

⁸ https://www.nema.org/docs/default-source/advocacy-document-library/nema-gridwise-comments-doe-dpa-rfi-11.30.22.pdf?sfvrsn=2969fc7b_4