Comments to New England States Transmission Initiative Request for Information

The WATT Coalition

October 28, 2022

I. Introduction

The WATT Coalition appreciates the opportunity to comment on the New England States Regional Energy Transmission Infrastructure Initiative September 1st, 2022, Request for Information (RFI). We support a proactively planned offshore grid and believe Grid-Enhancing Technologies will have an integral role in maximizing the value of additional transmission infrastructure.

Grid Enhancing Technologies (GETs) are essential tools for building a modern grid that is prepared for electrification of transportation and other industries and capable of meeting federal, state, and local clean energy goals. GETs, also referred to as advanced transmission technologies, are hardware and software solutions that increase the capacity, efficiency, and reliability of the transmission grid. These tools are already used in countries in Europe and South America and in Australia, where regulatory regimes reward efficiency in the bulk power system. In the US, adoption has been slower due to a lack of incentives for deployment.

The main types of GETs are Advanced Power Flow Controls (APFC) which are power electronics-based Flexible AC Transmission System (FACTS) devices that actively balance flows on transmission lines by pushing power off overloaded lines or pulling it onto under-utilized lines; Dynamic Line Ratings, software and hardware which identifies the real-time capacity of transmission lines; and Topology Optimization, software that identifies ways to reroute power flow around congested areas while maintaining reliability.

Studies have shown that GETs can double capacity for new renewable energy on the power grid, and the yearly cost savings from GETs often exceed their one-time installation cost.[1] Additionally, GETs can be installed or redeployed in weeks to respond to infrastructure or generation outages and other changing grid needs.

Each of these technologies provides opportunities for ratepayer savings by reducing grid congestion and avoiding more costly grid upgrades. While ISO New England has the lowest amount of transmission congestion and the smallest interconnection queue, significant buildout of offshore wind will create burdensome downstream congestion in the onshore grid.

By integrating GETs holistically into the transmission planning process, the states would ensure that they are minimizing ratepayer impact by looking at lowest cost solutions and maximizing

[1] *See* T. Bruce Tsuchida, Stephanie Ross, and Adam Bigelow, *Unlocking the Queue With Grid-Enhancing Technologies*, The Brattle Group (2021); U.S. Department of Energy, *Grid Enhancing Technologies: A Case Study of Ratepayer Impact* (2022).

ratepayer value by ensuring that power can be delivered as effectively as possible over existing infrastructure.

About the WATT Coalition

The Working for Advanced Transmission Technologies (WATT) Coalition is a trade association supporting wide deployment of GETs to accelerate the clean energy transition and lower energy costs. Members include grid technology, renewable energy, a transmission utility and investment company.

II. Comments on Changes and Upgrades to the Regional Electric Transmission System Needed to Integrate Renewable Energy Resources:

1. **Comment on how individual states, Participating States, or the region can best position themselves to access U.S. DOE funding or other DOE project participation options relating to transmission, including but not limited to funding, financing, technical support, and other opportunities available through the federal Infrastructure and Investment Jobs Act; and**

Beyond the ratepayer savings incurred by using GETs, incorporating GETs into transmission plans would position the New England States well to access three federal funding opportunities: Grid Resilience Formula Grants, Grid Resilience and Innovation Partnerships (GRIP) Program, and Interregional and Offshore Wind Electricity Transmission Planning, Modeling, and Analysis.

The Grid Resilience Formula Grants are designed to modernize grid infrastructure and increase grid resilience by providing $2.5 billion in funding to states. The program includes projects with "monitoring and control technologies." Grid plans involving GETs are eligible for funding under this program.

GRIP is composed of three different sections of the Infrastructure Investment and Jobs Act. The program provides $10.5 billion for Smart Grid Grants, the Grid Innovation Program, and Grid Resilience Industry Grants. Grid plans using GETs would be eligible to apply for federal funding under any of the GRIP programs.

The Interregional and Offshore Wind Electricity Transmission Planning, Modeling, and Analysis program provides $100 million for assistance with modeling and analysis of transmission. The money can be used for examining, "opportunities for use of non-transmission alternatives, energy storage, and grid-enhancing technologies." New England States should ensure applications include modeling and analysis of GETs, particularly for onshore grid upgrades.

2. **Comment on ways to minimize adverse impacts to ratepayers including, but not limited to, risk sharing, ownership and/or contracting structures including cost caps, modular designs, cost sharing, etc.**

The WATT Coalition supports a proactively planned offshore connection scheme that maximizes onshore infrastructure utilization by evaluating and installing GETs strategically over the system. A proactively planned grid will deliver cost savings to customers through more efficient use of interconnection points, fewer offshore cables, and reduced overall onshore and offshore grid costs. By making room for more potential generation, the cleanest and lowest-cost generation will be able to reach customers. However, ISO-NE studies of offshore wind integration in New England indicate the need for upgrades to the onshore grid to deliver offshore generation[2]

GETs are critical to increasing the capacity and utilization of the onshore grid while minimizing adverse impacts to ratepayers. There is a growing body of literature showing that GETs help increase grid reliability and reduce overall grid costs.[3] Transmission planners often focus exclusively on reliability needs with traditional line construction solutions, deprioritizing evaluation of technically equivalent FACTS-based alternatives and incorporation of economic benefits from congestion reduction with other GETs, to the detriment of customers.

GETs have been shown to reduce congestion through better grid utilization. Nationally, it is estimated GETs could cut costs by one-third or $2 billion per year.[4] When accounted for properly in planning GETs can ensure that the highest value transmission infrastructure is built by resolving constraints that do not require new infrastructure.

Additionally, GETs can provide a bridge solution as new infrastructure is built, allowing new offshore generators to connect and deliver before major new transmission infrastructure is complete. For example, in Texas in 2006 AEP avoided a $20 million upgrade by installing real-time line ratings on a 138 kV transmission line, avoiding a stranded asset.[5]

GETs offer additional value because they are scalable to address evolving grid needs. GETs, after being installed, can be scaled up or also be redeployed elsewhere on the grid given updated information and changing contexts. For example, APFC devices are modular deployments of multiple devices that can be installed in phases to address immediate, then medium, and ultimately long-term needs. Similarly, many DLR sensors and systems can be redeployed as grid needs change.

3. Identify the advantages and disadvantages of utilizing different types of transmission lines, like alternating current (AC) and direct current (DC) options for transmission lines and transmission solutions. Should 1200MW/525kV HVDC lines be a preferred standard in any potential procurement involving offshore transmission lines?;

No comment.

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[2] ISO-NE, "Draft 2050 Transmission Study," 49-52 (2021).
[3] *See* WATT Coalition Resource Library.
[4] *See* J. Schneider, "Transmission Congestion Costs in the U.S. RTOs," Grid Strategies LLC (2019).
[5] S. Aivaliotis, "Dynamic Line Ratings for Optimal and Reliable Power Flow" [FERC Technical Conference Presentation], The Valley Group 29-32 (2010).

4. **Comment on whether certain projects should be prioritized and why. For example, should a HVDC offshore project that eliminates the need for major land- based upgrades be prioritized over another HVDC offshore project that does not eliminate such upgrades;**

The WATT Coalition believes when the New England States are considering a proposed transmission project, they should conduct a robust analysis of the lifecycle cost and modeled utilization of each project. Transmission investments will typically benefit from targeted GETs installations that help ensure full utilization of the new capacity.

5. **Identify any regional or interregional benefits or challenges presented by the possibility of using HVDC lines to assist in transmission system restoration following a load shedding or other emergency event and particularly from using the black start capabilities of HVDC lines in the event of a blackout;**

No comment.

6. **Identify the benefits and/or challenges presented by using land based HVDC lines or other infrastructure to increase the integration of renewable energy (other than offshore wind) in New England to balance injections of offshore wind;**

Implementation of GETs could help balance offshore wind injections by facilitating the delivery of additional capacity from other New England renewable resources or Canadian hydropower.

The U.S. DOE and the Brattle Group in separate studies found that the use of GETs can reduce renewable energy curtailments and increase renewable energy interconnections.[6] The Brattle Group study showed that the application of GETs in the Kansas and Oklahoma grids would enable twice as much renewable energy capacity without any traditional transmission upgrades. The one-time installation cost of the GETs would be only $90 million, compared to yearly production cost savings of $175 million.[7] The U.S. DOE study arrives at similar conclusions finding that GETs can reduce congestion and facilitate an increase in renewable capacity on the grid while providing relatively short payback periods.[8]

Additionally, a U.S. DOE report demonstrated that, depending on conditions, a conductor can increase its carrying capacity by 44 percent, indicating that significant increases in transmission

[6] *See* The Brattle Group, *Unlocking the Queue*; DOE, *Grid Enhancing Technologies: A Case Study of Ratepayer Impact*.
[7] The Brattle Group, *Unlocking the Queue*, at 10.
[8] DOE, *Grid Enhancing Technologies: A Case Study of Ratepayer Impact*, at iv-x.

capacity can be realized by utilizing DLR.[9] This increased transmission capacity is highly valuable in potentially increasing the integration of renewable energy projects.

7. Comment on the region's ability to use offshore HVDC transmission lines to facilitate interregional transmission in the future;

No comment.

8. Comment on any just-transition, environmental justice, equity, and workforce development considerations or opportunities presented by the transmission system buildout and how these policy priorities are centered in decisions to develop future infrastructure;

GETs have been shown to increase renewable energy capacity, which is necessary for reducing emissions associated with power generation. Improving local pollutants and lowering emissions addresses longstanding environmental justice concerns and often benefits low-income communities and communities of color.

The National Renewable Energy Laboratory (NREL) estimated that between 2024-2030 the U.S. offshore wind industry will need between 15,000-58,000 jobs annually to meet the Biden Administration's goal of 30 GW of offshore wind by 2030.[10] The WATT Coalition believes a key to maximizing workforce development is a proactively planned grid using technologies to maximize grid utilization.

Ultimately, GETs offer a lower cost, emissions, and environmental footprint means of upgrading the network than traditional new line infrastructure. With lower community disruption in the near term, GETs should be the preferred means for NE utilities to manage the impacts of offshore connections.

9. Comment on how to develop transmission solutions that maximize the reliability and economic benefits of regional clean energy resources.

The WATT Coalition believes that in order to maximize the reliability and economic benefits of regional clean energy sources the New England States should have a proactively planned grid that incorporates GETs. GETs can help avoid delays when major grid upgrades will take years to build, increase grid reliability, quickly integrate renewables, and reduce congestion costs for ratepayers.[11] They can also obviate the need for traditional grid upgrades in some cases, which

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[9] U.S. Department of Energy, *Dynamic Line Rating Systems for Transmission Lines Topical Report*, in Smart Grid Demonstration Program, vi (2014).

[10] J. Stefek, C. Constant, C. Clark, H. Tinnesand, C. Christol, R. Baranowski, 2022, *U.S. Offshore Wind Workforce Assessment*. Golden, CO: National Renewable Energy Laboratory, NREL/TP-5000-81798, https://www.nrel.gov/docs/fy23osti/81798.pdf.

[11] The Brattle Group, *Unlocking the Queue*, at 9-12.

creates significant cost-savings for ratepayers. The New England States should ensure that all planning and analysis should include GETs and fully incorporate all grid benefits.

No Comments on the Draft MOWIP.

III. Contact

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Signed,

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