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May 9, 2025

VIA E-FILING
Mr. William Seuffert
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
Saint Paul, MN 55101-2147

Re: In the Matter of the 2025 Biennial Transmission Projects Report Docket No. E999/M-25-99

Dear Mr. Seuffert:

The WATT Coalition respectfully submits these reply comments, which have been e-filed through www.edocket.state.mn.us.

Please let me know if you have any questions.

Sincerely,

Julia Selker
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WATT Coalition
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BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

IN THE MATTER OF THE 2025 BIENNIAL TRANSMISSION PROJECTS REPORT	)))	**E999/M-25-99**

REPLY COMMENTS OF THE WATT COALITION

May 9, 2025

I. Introduction

The Working for Advanced Transmission Technologies (WATT) Coalition appreciates the opportunity to provide reply comments to the Minnesota Public Utilities Commission on the 2025 Biennial Transmission Projects Report. These reply comments address the responses to the specific questions around the key issue identified in the Commission's notice: *What methodology is appropriate for calculating the payback period of Grid Enhancing Technologies (GETs) as directed by Minnesota Session Laws, 2024, Chapter 127, Article 42, Section 52?*

II. About the WATT Coalition

The WATT Coalition is a trade association focused on facilitating the adoption of advanced technologies on the US electric transmission system that improve reliability, lower costs, and enable economic development. WATT includes generation owners and developers, clean energy finance interests, and transmission owners; and technology vendors, offering expertise in Advanced Power Flow Control, Dynamic Line Ratings, and Topology Optimization. The views and opinions expressed in this filing do not necessarily reflect the official position of each of WATT's individual members.

III. Summary of WATT position

The optimal implementation of *Minnesota Session Laws, 2024, Chapter 127, Article 42, Section 52* would use a practical and transparent approach to calculating the payback period for GETs by the end of 2025 on highly congested lines. The record shows that utilities have proven methodologies for these goals. The Minnesota Transmission Owners ("MTO") identify historical congestion rent and Adjusted Production Cost ("APC") modeling as tools for estimating benefits of GETs deployments. WATT recognizes these as best practices at this time, with the former being applied for historical congestion and the latter best used for forecasted constraints.

WATT emphasizes that future congestion is foreseeable and already modeled in transmission planning. In this one-time study mandated by the 2024 Session Law, the goal should be to identify high-value deployments that build experience and deliver immediate benefit. As the MTOs identified, APC modeling may not capture all congestion. WATT still believes that it is the best available method for calculating the value of mitigating future congestion. Where credible savings are identified, GETs implementations should be applied. As best practices evolve, the transmission owners may find more effective means of evaluating the payback period for GETs. WATT encourages the Commission to monitor utility implementation to ensure methodologies reflect best practices.

Regarding a threshold payback period where GETs should be included in an implementation plan, WATT recommends that the PUC use a five-year period. This standard ensures that the most promising, near-term opportunities are prioritized for ratepayer benefit.

IV. In addition to the frequency of congestion and increased costs to ratepayers (as required by Subd 2, clause 2), what, if any, issues, costs, and benefits are relevant to calculating the payback period of GETs installed to reduce transmission system congestion?

A. Addressing concerns around perceived downside risk

Concerns raised in the record about the potential downsides of GETs include shifting congestion, coordination challenges, and installation impacts. Each of these represents an instance where increased information about and control of the system with GETs identifies other issues. These problems may prevent the full benefits of GETs from being realized, but transmission owners should do their best to address each.

Comments from MTO highlight that GETs may simply shift congestion to the next limiting element.[1] This is the case when the GETs deployment unlocks more capacity than the next limiting element can transmit, which is a normal and expected dynamic in grid operations and planning. However, even very expensive grid congestion can be relieved with a modest increase in capacity – it may be that a GETs deployment is still cost-effective even if congestion persists or moves to another part of the system.

It is standard practice to resolve the most limiting constraint first and evaluate what, if any, new bottlenecks emerge. If a model shows that the congestion will move, utilities should calculate the cost of addressing that next constraint, with GETs or traditional upgrades. If the next constraint cannot be addressed cost-effectively along with the initial GETs solution, then the transmission owner may find the initial GETs deployment would not create net benefits. Regardless, the study would still be useful because it could identify other upgrades that would be cost-effective.

MTO further notes[2] that coordination across shared substations may pose "additional regulatory and cost recovery challenges." WATT agrees that this challenge exists, but it is not unique to GETs. Seams coordination is a known issue in broader transmission planning and should not be a barrier to implementing cost-effective solutions like GETs that benefit ratepayers. Utilities can and should work through MISO to resolve such issues.

MTO suggests including the cost of outages caused by the installation of GETs as a relevant cost in calculating the payback period of GETs.[3] WATT does not object to this inclusion. Unlike traditional upgrades, most GETs do not require significant outages. DLR and sensor-based systems are installed quickly and with minimal disruption. For example, some vendors complete installations in less than a day.[4] Meanwhile, topology optimization software is one such GET that is entirely software based, and therefore does not require any outages at all.

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[1] Minnesota Transmission Owners, *Initial Comments of the Minnesota Transmission Owners*, Docket No. E999/M-25-99, filed April 11, 2025, at 3 (hereinafter, "MTO").
[2] *Id*, at 3.
[3] *Id*, at 4.
[4] Great River Energy, "Grid optimization project kicks off with drone installation event," press release, May 8, 2024, https://greatriverenergy.com/cooperatives-articles/grid-optimization-project-kicks-off-with-drone-installation-event/.

MTO also suggests that instances of reduced capacity from DLR should be included when projecting GETs benefits.[5] WATT recognizes that there are rare occasions when a real-time rating may be lower than a static rating and agrees that this should be included in the benefits calculation of GETs. This information about reduced capacity is critical to grid reliability. Understanding when the real rating of a transmission line is lower than its ambient or static rating gives utilities a full picture of their risk profile and allows them to protect infrastructure in scenarios that could otherwise have been damaging.

Finally, MTO suggests that GETs should be evaluated in the context of other planned solutions to avoid duplicative efforts to relieve congestion. MTO specifically cites an example[6] from 2023 where Great River Energy "participated with the other GNP [Grid North Partners] members to develop a series of transmission solutions intended to reduce near-term transmission congestion in the Upper Midwest, with implementation dates from 2023 through 2026." WATT agrees with MTO that GETs should be evaluated in the context of other planned solutions and views this as an argument in favor of robust analysis of GETs. For instance, the GNP transmission expansion effort was announced over four years ago in February 2021, where GNP stated[7] that they were "coordinating with [MISO] and other stakeholders to develop a transmission expansion plan for the Upper Midwest." GNP officially announced[8] 19 transmission project upgrades in October 2023 through this effort to address congestion. In such cases where traditional upgrades take years to deploy, GETs could act as bridge solutions to deliver ratepayer benefits in the interim, during planning and construction of larger-scale investments.

V. What methodology should the Commission direct affected transmission owners to use in calculating the payback period of GETs in reducing congestion?

A. A practical, transparent approach for a methodology is grounded in congestion rent

Both WATT and MTO recommend using a congestion rent calculation to quantify historic congestion. MTO evaluated several metrics to estimate the benefits of GETs in relieving congestion, including shadow prices, and ultimately recommended congestion rent as the best option.[9] WATT agrees with MTO that historical congestion rent is the appropriate baseline metric. While it is not a precise measure of consumer savings, it is the most feasible and representative dataset available for identifying cost savings.

MTO explains that utilities could also use PROMOD-based Adjusted Production Cost ("APC") modeling to estimate total likely cost savings.[10] WATT believes that APC modeling is the best option for evaluating forward-looking congestion, as law requires. Minnesota utilities have indicated that they already model future congestion to make transmission investment decisions. Minnesota Power's 2025

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[5] *MTO*, at 3.
[6] *Id*, at 4.
[7] Grid North Partners, *Grid North Partners Fact Sheet* (February 2021), https://gridnorthpartners.com/wp-content/uploads/2021/02/Grid-North-Partners-Fact-Sheet.pdf.
[8] Grid North Partners, "Grid North Partners utilities to implement 19 electric transmission upgrades to reduce system congestion," press release, October 11, 2023, https://gridnorthpartners.com/wp-content/uploads/2023/10/Congestion-projects-press-release-Grid-North-Partners-2023.pdf.
[9] *MTO*, at 5.
[10] *Id*, at 5.

IRP notes[11] that the GNP Tech Team, in conducting their transmission expansion plan, "studied and announced the identification of 19 transmission upgrades to reduce system congestion" and that "the study work that was performed looked at both historical and forward-looking congestion." While it is not clear what methodology was used in the GNP study, it is clear that Minnesota utilities have used forward-looking congestion value in infrastructure planning.

While APC modeling does not identify all future congestion or potential savings, it is the best available technology today. We understand that modeled APC savings can be sufficient to support a major capital project, so they should likewise be sufficient to warrant GETs solutions that deliver targeted relief with shorter lead times and lower costs.

B. The Commission should monitor utility methodology to ensure it follows best practices.

The study outlined in the 2024 law will identify high-value GETs deployments, and help utilities gain experience with the technology and methods for calculating benefits. Initial methodologies should be practical, transparent, and developed collaboratively between utilities and stakeholders, including technology vendors. As utilities build implementation experience, these methods can be refined into best practices. Utilities should evolve their approaches as industry standards mature.

VI. What payback period value should the Commission set as the threshold at which a GETs project must be included in the implementation plan portion of a GETs Report?

The WATT maintains its original position that a simple universal threshold is the most transparent approach to implementing the statute. Alternatively, the MTO's suggest that:

> "The payback period value threshold should be on a gradient scale to reflect the specific technology and application of each GET. For some technologies, such as dynamic line rating implementation, the payback period may be very short and almost immediate. Other GETs may have a longer payback period, and the threshold for those should be set at or near the expected life of the technology."[12]

The DOC also offers an alternative approach: a Benefit-Cost Ratio which is a common method for evaluating transmission investment.[13] However, the law requires the calculation of payback periods. Including a calculation of a simple, transparent payback period metric will be helpful for stakeholders to understand the value of implementing GETs.

Our proposal for a five-year payback period also reflects the reality that congestion patterns shift over time, and it is reasonable to estimate benefits over a shorter horizon rather than the full lifetime of the assets. Traditional transmission upgrades are evaluated over decades but GETs are lower-cost and faster to deploy. Setting a higher bar by requiring projects to pay for themselves within five years will help focus attention on high-value, near-term deployments. If utilities identify GETs projects with

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[11] Minnesota Power, *2025-2039 Integrated Resource Plan, Appendix F: Transmission Planning Activities* (March 2025), at 17, https://minnesotapower.blob.core.windows.net/content/Content/Documents/Environment/IRP/2025/AppendixF-TransmissionPlanning_PUBLIC.pdf.

[12] page 6

[13] *Id*, at 5.

longer payback periods that still appear cost-effective and beneficial, they could pursue those investments through other transmission planning processes.

VII. Should the Commission request or require transmission owners to evaluate the cost effectiveness or payback periods of GETs projects addressing locations likely to experience high levels of congestion during the next five years (Subd. 2, clause 3), in addition to those with existing congestion (Subd. 2, clause 1)?

A. The law requires evaluation of both current and projected congestion.

The Commission should require transmission owners to evaluate the cost-effectiveness of GETs in areas likely to experience high congestion over the next five years, as directed by the 2024 statute. The law requires evaluation of GETs to address historical congestion and congestion "likely to occur over the next five years." The Department of Commerce affirms[14] this interpretation, stating that "GETs projects should be studied for all current and projected areas of congestion".

WATT respectfully disagrees with MTOs assertion that future congestion should be excluded from consideration due to uncertainty. Ignoring future congestion would contradict the mandate of the statute and result in missed opportunities for ratepayer savings and grid optimization. MTO argues there are "too many unknowns" to justify evaluating future congestion.[15] While transmission congestion forecasts do not capture all future congestion, studying planned outages as WATT proposed in our initial comments is one way to capture near-certain future grid constraints.

This should not be overly burdensome on utilities. Utilities and MISO commonly use modeling tools like PROMOD, PLEXOS, and capacity expansion models to forecast congestion, reliability violations, and production costs, for the purposes of traditional transmission, generation, and interconnection planning. For example, WATT's initial comments show that MISO and Minnesota utilities are already identifying forward-looking congestion, including that caused by planned outages, generation shifts, and known system constraints.[16]

B. GETs are particularly well-suited to addressing future congestion, as risks of stranded costs are lower.

While all transmission investments carry some risk that expected benefits may not fully materialize, GETs carry less risk than traditional infrastructure. MTO raises concerns about "stranded costs" if a projected constraint fails to emerge.[17] However, because GETs are inexpensive, modular, and quickly deployable, this risk is much lower. If a deployment proves unnecessary, it can often be deactivated, repurposed, or moved, unlike a new substation or transmission line. This is not true of traditional infrastructure, which is far more capital-intensive and fixed. In addition, most DLR technologies offer asset health and situational awareness data that can be useful to utilities for maintenance and investment decisions.

II. Are there other issues or concerns related to this matter?

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[14] *Id*, at 7.
[15] *MTO*, at 7.
[16] WATT Coalition, *Initial Comments of the WATT Coalition*, Docket No. E999/M-25-99, filed April 11, 2025, at 4 (hereinafter, "WATT").
[17] *MTO*, at 7.

A. Ambient-Adjusted Ratings under FERC Order No. 881 are not a substitute for GETs.

MTO suggests that ambient-adjusted ratings (AAR), as required under FERC Order No. 881, may reduce the need for GETs by offering a lower-cost solution.[18] WATT agrees that AAR can help address baseline underutilization of transmission capacity, but AAR should be seen as a minimum compliance tool, not a substitute for full wind-based DLR or other GETs. An MIT study found that AAR captured only half the benefit of DLR: while AAR enabled 160 MW of additional solar and 800 MW of wind in their study over the ERCOT system, DLR enabled 360 MW of solar and 2,250 MW of wind generation. Further, DLR delivered twice the system cost savings as AAR.[19]

B. Minnesota's law and FERC's rulemaking are complementary, not conflicting.

MTO raises the concern that Minnesota's GETs requirements could eventually conflict with pending federal rules on DLR. WATT believes that Minnesota's legislative mandate is distinct and complementary. The Minnesota law requires utilities to evaluate GETs for cost-effectiveness and report on payback periods. This is a report on a planning evaluation, not an operational standard. In contrast, FERC Order No. 881 and its potential successor rule (RM24-6-000) address minimum operational requirements for transmission line ratings under normal conditions. These are floor-level standards, not a substitute for comprehensive utility GETs evaluation. In addition, the rulemaking that the MTOs refer to is currently an Advanced Notice of Proposed Rulemaking, which means the implementation of any final rule associated with the proposal is at least several years away. The transmission owners' studies may provide valuable insight as FERC designs a final rule on where DLR should be used.

C. Minnesota has an opportunity to act now; delay would cost ratepayers.

States like New York, New Jersey, and California are already taking action on GETs alongside Minnesota. Minnesota has an opportunity to lead the Midwest by acting now.

Respectfully submitted,

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[18] *Id.*
[19] Lee, Nair, and Sun, *Impact of Dynamic Line Ratings on the ERCOT Transmission System* (July 2022), https://www.linevisioninc.com/news/this-mit-study-simulated-dynamic-line-ratings-across-the-ercot-grid-the-results-were-impressive.

CERTIFICATE OF SERVICE

Julia Selker certifies that on the 9th day of May, 2025, she e-filed a true and correct copy of the initial comments on behalf of WATT Coalition via eDockets (www.edockets.state.mn.us) in Docket No. E999/M-25-99.
Executed on: May 9, 2025
Signed:

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