

**UNITED STATES OF AMERICA BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

Improvements to Generator) **RM22-14-000**
Interconnection Procedures)
And Agreements)

**WATT COALITION REPLY COMMENTS
December 14, 2022**

The WATT Coalition appreciates the opportunity to submit reply comments on the Federal Energy Regulatory Commission’s (“the Commission”) June 16th, 2022, Notice of Proposed Rule Making (NOPR) in the above-captioned proceeding.

The WATT Coalition continues to support the Commission’s proposals to better incorporate GETs in the transmission planning and generator interconnection processes. The WATT Coalition also reiterates our recommendation that the Commission adopt our “opt-out” proposal.¹ In our NOPR comments, we recommended an “opt-out” standard rather than “opt-in” framework in the Commission’s proposal that transmission providers must evaluate Grid-Enhancing Technologies (GETs) solutions during the interconnection study process upon request of the interconnection customer. We believe advanced transmission technologies should be considered as a routine matter in interconnection processes in all regions under the Commission’s jurisdiction.

I. 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, and investment companies, and a transmission owner. WATT currently supports three technologies in particular: 1) Dynamic Line Ratings (DLR) which determine the true, real-time capacity of power lines. 2) Advanced Power Flow Control (APFC) which changes line impedance so planners and operators can fully utilize lines with available capacity. 3) Topology Optimization which identifies the best grid reconfigurations to reroute flow around bottlenecks. These three technologies reduce congestion costs and improve economic dispatch, situational awareness and reliability.

II. Thirty commenters from across the energy sector support incorporating Alternative Transmission Technology/GETs in the interconnection study process

In initial comments to the NOPR, thirty commentors were supportive of the Commission's proposal to incorporate Alternative Transmission Technology/GETs in the LGIP/SGIP interconnection study process. Support came from across the energy sector, including utilities,

¹ See Initial comments of the Working for Advanced Transmission Technologies (WATT) Coalition to the Federal Energy Regulatory Commission for Improvements to Generator Interconnection Procedures and Agreements NOPR, Docket RM22-14-000, October 13, 2022. <https://watt-transmission.org/wp-content/uploads/2022/10/WATT-Comments-under-RM22-14.pdf>.

CAISO, NGOs, trade associations, large energy customers, interconnection customers, state regulators, and state consumer advocates.

Additionally, nine groups supported a version of the WATT Coalitions proposal for GETs to be included as a business-as-usual element of interconnection studies, with interconnection customers being able to opt out for their individual projects. The organizations include NGOs, trade associations, large energy customers, interconnection customers, investment companies, and think tanks.

We agree with this broad consensus and recommend the Commission proceeds with its proposals to incorporate GETs in the interconnection process. Appendix A provides a list of parties that support the inclusion of GETs in the interconnection process, along with citations to the specific points in their comments.

III. Comments concerned with the inclusion of GETs increasing the number and complexity of studies and potentially delaying interconnection processes are overstated

a. An “opt-out” standard normalizes the use of GETs as an additional default solution similar to reconductoring, adding a circuit, or raising a tower.

WATT’s “opt-out” proposal standardizes the interconnection study process and ensures GETs are evaluated at the beginning of the interconnection study like many other technological solutions that are currently considered. In various comments expressing concerns over the Commission’s proposal to incorporate GETs in the interconnection study process, commentors suggested that allowing interconnection customers to request studies incorporating the Commission’s proposed list of alternative transmission technology would lead to a significant increase in the number of studies.

WATT believes that the Commission’s proposal does not represent a significant divergence from the current process. RTOs and transmission providers currently use an iterative process when conducting interconnection studies and adding the proposed list of GETs to an iterative solution set should not significantly change the timeframe or complexity. Relevant GETs are comparable to legacy Flexible AC Transmission System (FACTS) devices, phase-shifting transformers, and other transmission infrastructure solutions. When treated as a tool in the toolkit by transmission providers, relevant GETs are no more difficult to study than other technologies and therefore a “reasonable number” of study requests is merely a function of the number of relevant constraints associated with the cluster of interconnection customers.

Additionally, as the grid has evolved, each RTO or transmission provider has developed a set of rules and go-to solutions when different problems arise within interconnection studies. An RTO or transmission provider may utilize a default or “rule-of-thumb” solution they have developed for common violations that occur in interconnection studies. This familiarity bias slows the adoption of new, and potentially less expensive or more effective, technologies.

WATT believes interconnection studies should become more automated. Best practices for the evaluation and use of approved GETs should be developed. Our “opt-out” proposal which would require RTOs and transmission providers to begin studies with an approved set of GETs

standardizes and normalizes GETs as a solution to common violations identified by interconnection studies. With this change, if a violation is identified, evaluating DLR or APFC as a solution to the violation becomes a simple decision point just as evaluating reconductoring, adding a circuit, or raising a tower is today.

b. The WATT Coalition believes concerns over the number of studies could also be managed with appropriate rules and proposes the following solution for the Commission’s consideration.

If the Commission is still concerned by the number of studies created by including GETs by default, the WATT coalition proposes adopting our “opt-out” standard with the following specification.

Today's established multistage cluster processes include decision points following the completion of system impact study phases. At the end of a decision period, a planned restudy occurs in a subsequent phase to account for customer withdrawals. This includes assessments of the need for system mitigation. Critically, restudies are hardwired in tariff rules and queue business practices. The application of GETs solutions in the subsequent phase can be similarly hardwired in the restudy process.

Consistent with the “opt-out” standard WATT has articulated in initial comments, transmission providers will incorporate an approved set of GETs at system impact study kickoff. The approved technologies should be specified in the Business Practices Manual, and should include, at a minimum, DLR, APFC, and topology optimization.

Thereafter, on the condition that customers satisfy additional queue process requirements, and move to subsequent study phases, interconnection customers’ GETs choices become limited to specific technology solutions that address distinct violations identified in the initial round of studies. This will narrow the iterative applications of GETs.

If the interconnection customers want the TOs to study a specific list of GETs that the TO did not initially suggest, they should be able to make that request. In such a case, RTOs and transmission providers could request modeling, analysis, and an engineering assessment from the interconnection customer which finds the proposed GETs solution will neither delay the queue phase nor cause additional cycle upgrades. The proposed GETs solution would be carried into the final study phase and become an implementation milestone in the project’s Generation Interconnection Agreement (GIA).

By allowing interconnection customers to provide informed input on the studies before they are completed, the study process should be shorter and there should be fewer iterations than the Commission’s initial proposal.

c. GETs provide a short- to medium-term solution that allows renewable generation to come online more quickly by bridging the misalignment between generation and transmission development timelines.

Finally, there are certain situations where GETs could be used as a mitigation tool. In scenarios where there are timing concerns between planned, new transmission infrastructure development

and the new renewable generation developed to utilize the new infrastructure, GETs can help bridge the difference in development timelines and bring the renewable generation online while the new transmission infrastructure is energized. Thus, GETs shorten the period between interconnection approval and delivering electricity, and if the GETs are no longer needed after the new infrastructure is completed, GETs may be redeployed in other areas of need.

IV. Comments suggesting that GETs have not been sufficiently vetted, are too complex, and are temporary technology not suited for long-term planning are inaccurate.

The WATT Coalition does not believe more research or experience is needed for implementation of GETs in the interconnection or transmission planning processes. GETs are fully commercialized technologies that have been deployed successfully in the United States for roughly a decade² and are heavily utilized internationally, particularly in Europe and Australia.³

If a transmission provider believes GETs are unsuited for long-term planning or are unreliable, they should be required to provide evidence in their compliance filings to the final rule in support of their position rather than requiring interconnection customers to bear the burden of proof.

a. Examples of deployment of GETs in the United States.

There have been numerous examples of GETs deployed in the United States, including dynamic line rating sensors. One of the most well documented DLR projects was conducted by Oncor Electric Delivery Company. The transmission and distribution system operator in Texas implemented two separate DLR projects. In the first project the capacity of the lines increased 8-12 percent and 6-14 percent on average for their 138 kV and 345 kV lines respectively.⁴

Most recently National Grid announced a partnership with LineVision to install Dynamic Line Rating technology on transmission lines in New York. National Grid will be operating the sensors in real-time on the transmission lines. National Grid stated that they expect to unlock additional transmission capacity to support the integration of renewable generation and meet their ambitious climate goals.⁵

² ONCOR DLR Case Study, U.S. Department of Energy, 2014.

https://www.energy.gov/sites/prod/files/2016/12/f34/Oncor_DLR_Case_Study_05-20-14_FINAL.pdf.

³ Improving Transmission Operation with Advanced Technologies: A Review of Deployment Experience and Analysis of Incentives, Brattle Group and Grid Strategies, 2019. <https://watt-transmission.org/wp-content/uploads/2019/06/brattle-grid-strategies-paper-improvingtransmissionoperationwithadvancedtechnologies.pdf>;

Dynamic Line Ratings: Innovation Landscape Brief, IRENA, 2020, https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Jul/IRENA_Dynamic_line_rating_2020.pdf?la=en&hash=A8129CE4C516895E7749FD495C32C8B818112D7C.

⁴ *Id.*

⁵ National Grid and LineVision Deploy Largest Dynamic Line Rating Project in the United States, LineVision, 2022.

<https://www.prnewswire.com/news-releases/national-grid-and-linevision-deploy-largest-dynamic-line-rating-project-in-the-united-states-301653906.html>.

Additionally, Lindsey Systems, who has been providing DLR systems around the world for the past 10 years, has DLR systems in operation at PacifiCorp, Pacific Gas & Electric, and Hydro Quebec (part of NERC) amongst other North American utilities.

b. GETs are successfully incorporated in transmission planning processes currently.

The WATT Coalition believes there is significant value in considering DLR in planning. We discussed this at length in our reply comments under RM-17-21-000 and are resubmitting Appendix B below, edited for relevance to the interconnection process.⁶ DLRs are currently used for transmission planning in ERCOT as a part of its regional transmission planning process, and even if DLR is not found to change outcomes in reliability-driven planning, it may affect economic and public policy driven planning.

A good example of incorporating power flow controls in the planning process is that of Australia's 2019 transmission plan (RIT-T). There, the planning process included a range of four "credible options" for evaluation. One option included power flow controls. The net present value of each option was calculated and ranked from one to five based on consumer benefit. The proposed preferred option, selected by the planners, utilized modular power flow control and was shown to have both the lowest cost and greatest market benefit compared to all other options.⁷

c. Legacy FACTS and power flow control devices are already utilized in transmission planning processes.

In current transmission planning processes in the United States, legacy FACTS systems and power flow control devices (e.g., phase shifting transformers) are already incorporated and adding GETs would not represent a significant difference. GETs are no more difficult to study as these legacy devices, and there is very little difference between Advanced Power Flow Control devices and legacy devices in terms of planning. However, 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.

d. GETs provide value in long-term planning by ensuring cost-effective solutions are utilized.

Under the current status quo, interconnection studies that identify small violations, such as a two percent line overload, lead to costly and often time-intensive solutions, such as reconductoring or building new lines. Instead, if GETs are included as part of interconnection studies and the

⁶ See WATT Coalition Reply Comments on Building for the Future Through Electric Transmission Planning and Cost Allocation and Generator Interconnection Regional, Docket No. RM21-17-000, 179 FERC ¶ 61,028 (2022) at 3-5, 12-17.

⁷ Victoria to New South Wales Interconnector Upgrade – Project Assessment Draft Report, AEMO and TransGrid, 2019. https://www.aemo.com.au/-/media/Files/Electricity/NEM/Planning_and_Forecasting/Victorian_Transmission/2019/VNI-RIT-T/Victoria-to-New-South-Wales-Interconnector-Upgrade-RIT-T-PADR.pdf.

planning process, a transmission provider could discover a GETs solution that is much more cost-effective and preserves the economics of projects and the overall goals of the system planners.

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. A Department of Energy study showed that these technologies pay for themselves within six months to two years based on lower customer costs, and they enable renewable energy projects to interconnect to the grid based on increased transmission capacity.⁸

Signed on behalf of the WATT Coalition,

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⁸ Grid-Enhancing Technologies: A Case Study on Ratepayer Impact, U.S. Department of Energy, 2022. <https://www.energy.gov/sites/default/files/2022-04/Grid%20Enhancing%20Technologies%20-%20A%20Case%20Study%20on%20Ratepayer%20Impact%20-%20February%202022%20CLEAN%20as%20of%20032322.pdf>.

APPENDIX A – Excerpts from commentors expressing support for GETs

Bolded comments indicate support for a version of the WATT Coalition’s opt-out interconnection study proposal for GETs.

Public Interest Organizations

PIOs support requirements that bring alternative transmission technologies into the interconnection process. ...The Commission should also require transmission providers to identify in their annual reports barriers to using alternative transmission technologies in the interconnection process.

Many of the technologies listed by the Commission in this rulemaking, as well as technologies not listed, are in use in the United States and abroad and can be useful in solving transmission issues typically limited to traditional network upgrades. Alternative transmission technologies fulfill the needs of some interconnection customers faster and/or at lower cost than traditional network upgrades, resulting in lower costs for interconnection and faster interconnection of low-cost, resilience-boosting generation. A 2021 study by the Brattle Group found that a combination of advanced power flow control, dynamic line rating, and topology optimization can in many cases bring renewable generation online faster and cheaper than traditional network upgrades. (pg. 53-54)

Apple Inc.

We agree with many of the comments made by the Clean Energy Buyers Association, including the importance of including new transmission technologies in the study process, which may result in more available interconnection capacity, making more accurate determinations of expectations of hybrid solar and storage resources, and making data available to all prospective interconnection customers. (pg. 1)

Fervo Energy

Fervo supports the consideration and use of alternative grid enhancing technologies (GETs)—such as advanced power flow control, transmission switching, dynamic line ratings, static synchronous compensators, and static VAR compensators—to alleviate delays in the construction of network upgrades and to reduce the cost of those upgrades. Such alternatives can be valuable tools for the interim periods until construction of necessary network upgrades are completed, and they can delay the need for the upgrades altogether. Both of these outcomes further the goal of achieving more interconnection agreements, facilitating energy transmission, and the advancement of the energy transition and associated economic development.

Fervo supports a revision to the pro forma LGIP and pro forma SGIP that would require transmission providers to evaluate alternative transmission solutions during the LGIP cluster study and the SGIP system impact study and facilities study, specifically, an approach that would allow interconnection customers to identify which GETs would facilitate more rapid interconnection and to request that these are considered as an alternative to network upgrades. (pg. 7-8)

Cypress Creek Renewables, LLC

Cypress Creek strongly believes that transmission providers should utilize expanded technology options to address violations more cost effectively, consistent with FERC's endorsement of grid enhancing technologies ("GETs") in Docket No. RM21-17-000.56 Cypress Creek proposes that study results should incorporate GET options wherever appropriate to avoid delays and reduce costs. (pg. 26)

Comments and Protest of Community Renewable Energy Association and NewSun Energy LLC the New York State Public Service Commission and New York State Energy Research and Development Authority

The NOPR appropriately proposes to require transmission providers to use all available transmission technologies to integrate resources and reduce network upgrade costs. These reforms will also enable lower cost interconnections and relieve backlogs caused by unreasonably high network upgrade costs. As proposed in the NOPR, the customer should have the option to require that a transmission provider include new transmission technology in interconnection studies, including advanced power flow control, transmission switching, dynamic line ratings, static synchronous compensators and static VAR compensators. NewSun and CREA also support the proposal to require transmission providers to file an annual report on how advanced technologies have been incorporated into interconnection studies. The Commission should require such reports to be publicly available and to contain explanation of the number and type of such technology requests received, the number and type the transmission provider agreed to include in studies and in LGIAs, and where applicable the reasons for rejecting a request. (pg. 92-93)

ENGIE North America Inc.

ENGIE recommends that the Commission expressly permit interconnection customers to request evaluation of alternative transmission technologies. Enabling interconnection customers to propose alternative transmission technologies in lieu of conventional network upgrades may reduce overall costs and increase the efficiency of the interconnection process. The Commission could provide a non-exhaustive list of technologies such as dynamic line rating, transmission switching, power flow controls, static synchronous compensators, and static VAR compensators. (pg. 12-13)

EDF Renewables, Inc.

Second, the Commission should continue to support the deployment of GETs. The Commission has recognized that GETs can "enhance reliability, efficiency, capacity, and improve the operation of new and existing transmission technologies." Based on its own experience with GETs, EDFR strongly supports policies that result in the consideration and adoption of GETs. EDFR supports the Commission's proposal to require transmission providers, upon request of the customer, to evaluate advanced power flow control, transmission switching, dynamic line ratings, static synchronous compensators, and static VAR compensators during the study process for generator interconnection. EDFR agrees with the Commission that "the deployment of these transmission technologies may reduce interconnection costs by providing lower cost network upgrades to interconnect new generating facilities." In addition, EDFR supports the

Commission's proposal in its Transmission NOPR to require transmission providers in each planning region to consider dynamic line ratings and advanced power flow control devices in regional transmission planning and cost allocation processes. (pg. 13-15)

Environmental Defense Fund

The Commission should modify its proposed rule to require that transmission providers include alternative transmission technologies within interconnection studies, unless the transmission provider and all impacted interconnection customers agree to exclude them. (pg. 7-8)

Amazon Energy

Amazon strongly supports the Commission's proposal to allow generators to request consideration of such technologies, and urges the Commission to take the further step of requiring consideration of Alternative Transmission Technologies ("ATTs") and Grid Enhancing Technologies ("GETs") in the cluster interconnection study process. To that end, **Amazon supports Advanced Energy Economy's proposal to make the evaluation of ATTs and GETs in interconnection studies an opt-out process, rather than an opt-in process that must be initiated at the interconnecting customer's request as structured in the Commission's proposal.** (pg. 5-9)

Enel North America, Inc.

FERC Should Allow More Time for Interconnection Customers to Request Consideration of an Alternative Transmission Technology. Enel disagrees with the Commission's proposal to require Interconnection Customers to request the consideration of alternative transmission technologies no later than the scoping meeting (proposed LGIP section 3.4.6). Requiring this request to occur in the absence of study results and specific constraints to mitigate is inefficient. Interconnection customers will be forced to guess at which technologies would be most likely to be useful, even though those technologies may not be relevant to the constraint identified. This will result in interconnection customers submitting the maximum allowed number of alternative technologies for every interconnection requests. Instead, the Commission should adopt Enel's earlier proposal which would require Transmission Providers to post draft results and reports and to accept and consider feedback from the Interconnection Customer. (pg. 79)

Enel supports the Commission's proposal to require Transmission Providers to submit an annual informational report as proposed in NOPR paragraph 302. (pg. 81)

American Clean Power Association et al.

Enabling interconnection customers to propose alternative transmission technologies in lieu of conventional network upgrades can speed interconnection processes, while reducing overall costs to both load and interconnection customers. The Clean Energy Associations supports requiring evaluation of alternative transmission technologies such as dynamic line rating, power flow controls, transmission switching, static synchronous compensators, and static VAR compensators. (pg. 61-62)

In any final rule, the Commission should amend the appropriate clause in RTO/ISO/TP Generator Cluster Study Agreements to reflect an opt-out approach, where grid-enhancing technologies are automatically evaluated as an option in system impact studies unless all interconnection customers in a cluster expressly decide to exclude them. (pg. 63)

Invenergy Solar Development North America LLC, et. al.

Invenergy supports improved use of grid-enhancing technologies and, although the proposal is a step in the right direction, it does not go far enough.

It should not be incumbent on the interconnection customer to request this evaluation at the scoping meeting, at which point the customer will have no information about what issues may be identified through the study process. Instead of requiring that interconnection customers make a specific request for evaluation, transmission providers should evaluate the potential use of alternative transmission technologies as a matter of course, with the option for a customer to opt out of that analysis. (pg. 52-53)

Organization of MISO States, Inc.

As such, OMS supports the Commission's proposal to require that transmission providers, at the request of the interconnection customer, evaluate alternative transmission solutions during the LGIP cluster study, the SGIP system impact study, and the facilities study processes. (pg. 19-20)

Advanced Energy Economy

AEE strongly supports use of ATTs to reduce the need for costly network upgrades, improve reliability, and reduce costs to ratepayers, and we urge the Commission to strengthen its proposals to incorporate ATTs to ensure optimal use of these technologies by making consideration of ATTs mandatory (with the option for an interconnection customer to opt-out) and by requiring consideration of a non-exclusive list of ATTs. (pg. 42)

The California Independent System Operator Corporation

The CAISO supports the Commission's proposal to incorporate alternative transmission technologies into the generator interconnection process; however, the CAISO opposes the proposal it must be at the request of the interconnection customer. Transmission planners are already empowered to identify and employ new technologies. They do not need interconnection customers to request certain upgrades to consider them. The Commission's proposal would effectively require transmission planners and interconnection customers to negotiate each set of network upgrades, adding bureaucracy and slowing study processes. **The Commission should simply require transmission providers to include tariff provisions stating they will consider certain alternative transmission technologies for every interconnection and incorporate them where they are the cost-effective solution.** This would create the compliance obligation for transmission providers. If an interconnection customer believed it should have an alternative technology where the transmission provider refused, it could request an unexecuted GIA and raise the issue with the Commission. (pg. 37-39)

[National Association of Regulatory Utility Commissioners](#)

NARUC supports the Commission’s proposal to revise the pro forma LGIP and pro forma Small Generator Interconnection Procedures (“SGIP”), to require transmission providers, at the request of the interconnection customer, to evaluate alternative transmission solutions during the LGIP cluster study and the SGIP system impact study and facilities study processes. We also broadly support the Commission’s proposed list of alternative transmission technologies specified in the NOPR that an interconnection customer may request for evaluation, including advanced power flow control, transmission switching, dynamic line ratings, static synchronous compensators, and static VAR compensators. (pg. 38)

[CTC Global Corporation](#)

CTC believes that the consideration of alternative transmission technologies should happen through a two-step screening, for every interconnection cluster. (pg. 16)

CTC supports the requirement of a report, as a means to introduce accountability to the transmission provider’s process and to make more transparent any reticence in considering Alternative Transmission Technologies, including Advanced conductors. (pg. 17)

[American Council on Renewable Energy](#)

The Commission proposes to require that “transmission providers upon request of the interconnection customer, evaluate the requested alternative transmission solution(s) during the LGIP cluster study and the SGIP system impact study and facilities study within the generator interconnection process.” The Commission specifies the technologies for which such an evaluation may be requested as: “advanced power flow control, transmission switching, dynamic line ratings, static synchronous compensators, and static VAR.” **ACORE recommends that, as part of the identified best practices, the Commission should require inclusion of these technologies within the studies, or at a minimum apply an “opt-out” policy, rather than have such incorporation depend upon a request from an interconnection customer.** (pg. 6)

[The Public Utilities Commission of Ohio’s Office of The Federal Energy Advocate](#)

The Commission has identified a retinue of technologies that could be deployed more quickly and at lower cost than traditional network upgrades, but they have lacked much attention from transmission planners and are not currently considered in generator interconnection processes. Technologies include advanced power flow control devices, transmission switching, dynamic line ratings, static synchronous compensators, static volt-ampere reactive compensators, and electric storage in some cases. These grid-enhancing technologies (“GETs”) can improve operations, enhance system reliability, contribute to capacity, and more. Some GETs could provide substantial benefits by resolving thermal overloads and avoiding voltage collapse, among other things. Concerns among transmission providers regarding loss of interconnection queue positions and unrealistic modeling assumptions for advanced technologies and co-located resources have the practical effect of discouraging investments in what may be the most efficient resources and system solutions for customers. This should change.

The Ohio FEA fully supports FERC’s proposal to revise the pro forma LGIP and pro forma SGIP to require that transmission providers, upon request of an interconnection customer, evaluate and determine the feasibility of requested alternative transmission solutions. We support this evaluation – whether it is for one, more than one, or all GETs of interest to the interconnection customer, and whether it is for temporary or permanent service on the grid. (pg. 15-16)

[Electricity Consumers Resource Council](#)

Finally, transmission providers should consider GETs or other alternative technologies as standard practice when determining the impacts and potential upgrades necessary for interconnection to the grid. GETs have the ability to measure conditions in real-time and optimize transmission capacity or power flow control. These technologies have the potential to be less costly than system upgrades and would increase customer savings. In each cluster study, GETs and other alternative technologies should be studied as either temporary measures while upgrades are being constructed or as a long-term alternative to upgrades. Project developers should not bear the burden of requesting evaluation of these technologies and therefore consideration of these technologies should not be contingent on the express request of the project developer. In other words, consideration of GETs should be automatic. (pg. 11)

[AES Clean Energy Development, LLC](#)

AES Clean Energy generally supports the Commission’s proposal “to require transmission providers, upon request of the interconnection customer, to evaluate the requested alternative transmission solution(s) during the LGIP cluster study and the SGIP system impact study and facilities study within the generator interconnection process.” In particular, AES Clean Energy is supportive of including grid enhancing technologies in the evaluation of mitigations to identified constraints. (pg. 25)

[Ørsted North America Inc.](#)

Ørsted supports the Commission’s proposal to allow ICs to request the transmission provider to study alternative transmission solutions. Ørsted agrees with the definition of alternative transmission solutions contained in footnote 405 of the NOPR, however, we would respectfully request that the Commission add energy storage to this list of solutions. In addition to the study of alternative transmission solutions that the Commission envisions, Ørsted recommends requiring the deployment of these alternative technologies as an (medium-term or long-term) alternative to transmission build out. Ørsted believes that requiring the deployment of alternative transmission solutions would allow ICs the ability to commercially operate their generation facilities on time. Therefore, Ørsted recommends a pro forma LGIP and SGIP that would require the use of, or the option to use, alternative technologies for any project which requires network upgrades. Deployment of alternative transmission technologies may not necessarily replace the need for long-term transmission planning and transmission rebuild, but rather it could support the states in their efforts to meet mandated targets and projects that are commercially ready to operate on schedule. (pg. 15-16)

Consumers Energy Company

Incorporation of NTAs help lower transmission investment costs and create more equitable customer bills. GETs used in lieu of network upgrades often are more cost effective, better maximize use of the existing transmission network, reduce congestion, and may support more equitable and affordable customer bills. Consumers Energy encourages FERC to require ISO/RTO and transmission providers to materially consider NTAs as possible substitutes for network upgrades. Transmission providers should submit an annual report detailing considered NTAs, and also be incentivized to use GETs to improve efficiencies and maximize use of the existing transmission network and save costs. NTAs and GETs can result in more reasonable and prudent efforts to mitigate excessive transmission upgrade and overbuild costs. Other technologies supporting utilization of ambient adjusted ratings, dynamic line ratings, wind and similar adjustments options could also result in more feasible and equitable end user customer bills. (pg. 9)

Pine Gate Renewables, LLC

The Commission should also adopt the proposed reforms to incorporate alternative transmission technologies into the generator interconnection process. Specifically, Pine Gate supports the Commission's proposal to require the consideration of alternative transmission technologies in interconnection studies upon the request of the interconnection customer. Transmission providers should also be required to report annually on their implementation of alternative transmission technologies. (pg. 7)

Solar Energy Industries Association

Evaluating alternative transmission solutions during the cluster study will reduce network upgrade costs. SEIA supports the Commission's proposal to require transmission providers, upon request of the interconnection customer, to evaluate alternative transmission solutions. Many commenters in the ANOPR proceeding noted how alternative transmission solutions bring improvements in efficiency, capacity, reliability, and resiliency to the system, as well as increases efficient use of the system. Alternative transmission technologies are an ideal medium-term solution to transmission building that bridges the gap in timing between building generation (around five years) and building transmission (around 10 years) by expanding capacity on existing transmission lines enough to allow new generation to come online without significant network upgrades. (pg. 40-41)

Clean Energy Buyers Association

CEBA also appreciates the Commission's proposal to require transmission providers to accommodate requests to evaluate alternative transmission solution(s), as well as an annual informational report that will allow the Commission and the public to understand the success or challenges with incorporating alternative transmission technologies into interconnection studies. (pg. 5)

Hannon Armstrong Sustainable Infrastructure Capital, Inc.

The Commission has proposed that if the interconnection customer requests, the transmission provider must include evaluation of the requested alternative transmission technology or technologies in the cluster study report and interconnection facilities study report for the LGIP or the relevant feasibility study, system impact study and/or facilities study reports for the SGIP. **HASI suggests that the evaluation of the alternate transmission technologies should be required in the generation interconnection process regardless of any request by the interconnection customer.** One or more of these alternate technologies may be able to delay or eliminate the transmission upgrades identified in the interconnection studies under both ERIS and NRIS. If the upgrades cannot be avoided, these technologies nonetheless have the potential to provide additional transmission headroom to enable at least limited interconnection service (most likely ERIS) for the interconnection customer prior to the completion of the upgrade. (pg. 2)

R Street Institute

GI requestors should not have to ask for alternative technologies to be considered. TPs should be required to describe the benefits (or lack thereof) of the set of commercially ready technologies affirmatively, including advanced power flow control, transmission switching, dynamic line ratings, static synchronous compensators and static VAR compensators. That these technologies may be used as a temporary measure until other network upgrades are completed recognizes their expedient and powerful impact to reduce the cost and delays of GI, even if they only serve as a bridge to a permanent solution set such as cluster upgrades. Creating an annual informational report will allow the Commission to oversee the current use of a variety of technologies effectively. Asking transmission providers to explain why the technology is not in use should not be burdensome, and will provide the Commission and others with information. (pg. 16)

VEIR Inc.

VEIR conditionally supports the Commission's proposal to revise the LGIP and SGIP to require transmission providers to consider advanced power flow control, transmission switching, dynamic line ratings, static synchronous compensators, and static VAR compensators ("Alternative Transmission Technologies"), within the cluster study of the LGIP and within the system impact and facilities studies of the SGIP upon request of the interconnection customer ("Requirement"). VEIR conditions its support on the Commission:

- formalizing its proposal to revise the pro forma LGIP and pro forma SGIP to require transmission providers to submit an annual informational report to the Commission that details whether, and if so how, Alternative Transmission Technologies were considered in interconnection requests over the last year;
- formalizing its proposal to require transmission providers to include in such a report information about why Alternative Transmission Technologies that were considered were not deployed; and
- being prepared to eliminate the Requirement if the costs of the Requirement are greater than the benefits of the Requirement

Moreover, VEIR conditions its support for the Requirement on the inclusion of "advanced conductors" in the list of Alternative Transmission Technologies. (pg. 4-5)

Pattern Energy Group LP

Pattern agrees with the Commission's proposals concerning alternative technologies but has several additional recommendations. **First, public utility transmission providers should be required to study least-cost solutions when evaluating generator interconnection requests and therefore, should be required to evaluate the potential use of these types of technologies without a specific request by a generator interconnection customer.** (pg. 28)

APPENDIX B – DLR in Planning (abridged and amended from WATT Coalition Reply Comments under RM-21-17-000)

The WATT Coalition wishes to address claims that DLR should be used only in operations, as a tool to address real-time operational issues. The WATT Coalition agrees that DLR and other GETs should be an integral part of operations and operational planning, however DLR is also a critical tool in the mid to long-term planning process, interconnection studies included, for the reasons outlined below.

Historical data sets of dynamic line ratings can be analyzed to create probabilistic line ratings on a seasonal, monthly, or more granular level to inform the planning process. The additional data regarding the hourly/sub-hourly thermal rating that comes from DLR technology can help maximize the efficiency of transmission planning. For example, DLR has been used in operations in ERCOT since 2005,⁹ resulting in an estimated \$30M reduction in annual congestion management costs in the first year.¹⁰

At present, ERCOT utilizes DLRs in their Regional Transmission Plan (RTP) Process, as noted in Appendix A, Section 3.1.5 of the 2021 RTP Report:¹¹

“Dynamic ratings will be used for both the reliability and economic portions of the analysis. The ratings in reliability analysis will be based on the 90th percentile temperature as determined for the weather zone associated with the transmission element.”

Additionally, ERCOT has a feedback loop between the RTP and Operations as noted in Section 1.2 of the 2021 RTP Report:

“ERCOT Protocols Section 3.10.8.4(3) requires ERCOT to identify additional Transmission Elements that have a high probability of providing significant added economic efficiency to the ERCOT market through the use of Dynamic Ratings and request such Dynamic Ratings from the associated ERCOT Transmission Service Provider (TSP). This report identifies such Transmission Elements as part of its economic analysis.”

Another example of deferred investment illustrates how DLR could obviate the need for more costly transmission assets for renewable energy interconnection. In western New York, National Grid is working on a DLR project that, along with upgrades of a 4.8 mile circuit and limiting substation equipment, will avoid the rebuild of nearly 30 miles of double circuit transmission, and is projected to reduce wind curtailments by 350MW and add 190MW in

⁹ Report on Existing and Potential Electric System Constraints and Needs, ERCOT, 2005.
https://www.ercot.com/files/docs/2005/10/11/item_8b_october_10_transmission_report.pdf

¹⁰ 2005 Electric System Constraints and Needs, Public Utilities Commission of Texas, 2005.
https://interchange.puc.texas.gov/Documents/31867_1_492950.PDF

¹¹ 2021 Regional Transmission Plan, ERCOT, 2021
https://www.ercot.com/files/docs/2021/12/23/2021_Regional_Transmission_Plan_Report_Public.zip

additional headroom.¹²

We note that interconnection models must be internally consistent by reflecting the impact of the weather pattern that each scenario considers (e.g., summer peak, spring minimum load/high wind, etc.) not only on the load and resource dispatch but also on the potential ratings that transmission assets could achieve when using DLR technology. For example, with the use of DLR, line ratings in a high wind case should be significantly higher than in a summer peak case and this should be considered in the planning process. This will avoid the identification of unnecessary upgrades in the high wind case.

¹² Case 20-E-0197; Petition of Niagara Mohawk Power Corporation D/B/A National Grid for Cost Recovery of Phase 1 Local Transmission Projects; November 2021