May 8, 2025

VIA ELECTRONIC FILING

Will Seuffert,
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
Saint Paul, MN 55101-2147

RE: Comments of the Interstate Renewable Energy Council, Inc. in Docket E002/CI-24-318, Responding to the Notice of Opportunity to File Written Comments on April 7, 2025

Dear Secretary Seuffert,

Attached are comments filed on behalf of the Interstate Renewable Energy Council. If you have any questions regarding this filing, please do not hesitate to contact the undersigned.

Sincerely,

Shay Banton
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Interstate Renewable Energy Council
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BEFORE THE MINNESOTA
PUBLIC UTILITIES COMMISSION

In the Matter of a Commission Inquiry into a Framework for Proactive Distribution Grid Upgrades and Cost Allocation for Xcel Energy	DOCKET E002/CI-24-318

COMMENTS OF THE INTERSTATE RENEWABLE ENERGY COUNCIL, INC. RESPONDING TO THE NOTICE OF OPPORTUNITY TO FILE WRITTEN COMMENTS ON APRIL 7, 2025

The Interstate Renewable Energy Council (IREC) appreciates the opportunity to file these comments in response to the Commission's *Notice of Comment Period* (Notice) issued in this docket on April 7th, 2025.

IREC is a 501(c)(3) non-partisan, non-profit organization working nationally to increase consumer access to sustainable energy and energy efficiency through independent fact-based policy leadership, quality workforce development, and consumer empowerment. IREC's mission is to build the foundation for rapid adoption of clean energy and energy efficiency to benefit people, the economy, and our planet. In service of our mission, IREC works to increase the adoption of policies and regulatory reforms that expand access to and streamline interconnection of new clean energy resources to the grid. IREC has over 40 years of experience advancing policy innovations, and our work is informed by close collaboration with stakeholders in states across the country, our team's technical and regulatory policy expertise, and our commitment to a just transition.

IREC acted as a lead participant in the Proactive Grid Upgrades Workgroup ordered as part of Docket 23-452, and thus assisted directly in the drafting of this Draft Proactive Distribution Upgrade Framework (henceforth referred to as the 'Framework'). While we agree broadly with how the stakeholder process was conducted and with much of the procedural language defined within the Framework, there remain significant gaps in the proposed cost allocation process. Particularly, the Framework does not dictate replicable procedures through which the costs of grid investments that benefit both load and generation are allocated between rate-payers and interconnection customers. As such, we believe that the Commission should establish a Phase 2 of the Proactive Distribution Grid Upgrade Proceeding as proposed in 'Attachment B: Phase 2 Proposal' in order to explore and select an advanced cost sharing mechanism for allocating costs between investments with load and generation co-benefits. Below are our responses to each of the questions posed in this notice:

1. **Should the Commission establish a framework for Proactive Distribution Grid Upgrades for Xcel Energy?** As of the end of Phase 1, the Draft Proactive Distribution Grid Upgrade Framework is incomplete and requires further investigation to determine best mechanisms for cost allocation (Attachment A: Draft Proactive Upgrade Framework – K. Cost Allocation). However, this draft framework is a great starting point for the next phase of the framework development process.
2. **Which requirements from the Draft Proactive Distribution Upgrade Framework, as outlined in Attachment A, should the Commission adopt?** IREC refrains from recommending the adoption of specific areas of the framework, and instead seeks to critique the exclusion of certain content that should be further investigated and finalized in a Phase 2 of the working group process.
3. **Does the Draft Framework address the following topics from the Commission's September 16, 2024 Order in Docket E002/M-23-452?**
    a. **How to allocate the costs of proactive upgrades.** Partially, but does not address allocation of costs for investments with co-benefits to both new load and generation.
    b. **How to ensure any proactive upgrades are distributed in an equitable manner throughout a utility's service territory.** No. The draft sets equitable distribution of costs as an overarching objective, but does not provide comprehensive guidance on how to

achieve this objective. Therefore, more work is needed to define exactly how to ensure an equitable distribution of costs.

c. **If costs are socialized among ratepayers, whether portions of the upgraded capacity should be reserved for certain customer classes.** Yes. Several potential capacity reservation options are provided within the framework.

d. **How a proactive upgrade program would integrate with a utility's planned distribution investment programs.** No comment.

e. **How a utility's other capacity programs and changes to distribution standards impact available hosting capacity.** No comment.

f. **How to determine where and when there is a need for proactive upgrades using forecasted DER and load adoption.** Yes, the framework provides guidance on the range of forecasting considerations to apply when proposing a proactive upgrade.

g. **Whether there should be changes to any of a utility's service policy provisions such as Contributions In Aid of Construction (CIAC).** No comment.

4. **Should the Commission establish Phase 2 of the Proactive Distribution Grid Upgrade Proceeding as proposed in Attachment B, and if so, what should the scope and timeline be?** Yes, as there is a need to further evaluate more advanced cost allocation mechanisms, particularly in situations where there are co-benefits between both load and generation. Additionally, more discussions on specific equity provisions might be warranted as a more detailed cost allocation mechanism is developed.

5. **Are there other issues or concerns related to this matter?** No comment.

Note that as part of the Phase 1 process, IREC developed and proposed an equipment-centric, benefit-focused cost allocation framework which we believe addresses the current gaps in the Phase 1 framework. To ensure that this proposal is included and considered within Phase 2, we have elected to attach this proposal to our comments for Commission consideration (Attachment A).

Attachment A

Proposal for Proactive Hosting Capacity-Based Cost Allocation Framework for Use in Determining Co-Benefit Allocations Between Load and Generation Customers

Interstate Renewable Energy Council

Proposal for Proactive Hosting Capacity-Based Cost Allocation Framework for Consideration by the Proactive Planning Work Group

January 2025

Within a proactive hosting capacity process, allocating the cost of upgrades using the beneficiary-pays principle can be a significant challenge. But how does one determine who benefits from a specific upgrade? What if there are multiple beneficiaries for a particular upgrade? And how do we prioritize between potential investments? Answering such questions requires a replicable, scalable, and flexible cost allocation framework that effectively leverages proactive hosting capacity analyses, equitably distributes benefits to all parties, and grounds decision making in engineering realities.

To this end, IREC proposes a cost allocation framework built upon the use of proactive hosting capacity analyses for use in proactive planning within an integrated distribution planning process. This framework leverages these advanced and accurate grid analysis tools to evaluate the underlying rationale for distribution upgrades, and then leverages those thresholds to allocate costs between customer types. Additionally, the framework is built from the bottom-up utilizing an equipment-centric approach which standardizes and simplifies the allocation process. Below are each of the steps of this process which will be discussed in more detail:

STAGE I – Determine the **benefits distribution** across all grid upgrade options

STAGE II – Perform **proactive hosting capacity analyses** to determine load and generator thresholds

STAGE II – Select upgrade and allocate costs according to benefit distributions

STAGE I – Benefits Distribution

Foundational to this framework is the upfront benefits distribution across grid upgrade options which seeks to rectify the fact that such upgrades can provide direct and indirect benefits to both load customers and future interconnection applicants. This stage grounds the decision-making process in the engineering realities of distribution planning engineers who are engaging with a host of factors when deciding between upgrades. By identifying these benefits and proactively questioning their applicability to each equipment upgrade option, cost allocation will be made more structured and easier to perform.

The first step is to define the benefit categories by which the costs of each upgrade option will be split into. IREC recommends that stakeholders in Commission-led working groups should have the ultimate say in the definitions of such categories, however, we have proposed the following which have been vetted through our exploratory process.

DER-ENABLING – Upgrades that enable more distributed energy resources (DERs) to operate without direct benefits to Load Customers. Costs associated will therefore be allocated to and split amongst interconnection applicants (i.e., DER-CUSTOMERS).

RELIABILITY-ENHANCING – Upgrades that specifically enhance system reliability, as in added redundancy or outage reduction, that primarily benefits load customers without direct benefits to DERs. Costs associated will therefore be allocated and split amongst service customers (i.e., RATE-BASE)

CAPACITY-EXPANDING – Upgrade that expands system capacity for both future loads and DERs. Costs associated will be allocated between load customers and future interconnection applicants based on the results of a proactive hosting capacity analysis.

In defining these categories, utility engineers at the direction of their Commissions can then move on to assigning benefits to each upgrade type. This process requires that engineers disaggregate the individual components of an upgrade and consider how each benefits certain parties. Below are examples illustrating how utility engineers, under Commission direction, can disaggregate the components of an upgrade, assess the specific benefits to different parties, and determine the appropriate cost allocation for each.

	DER-ENABLING	RELIABILITY-ENHANCING	CAPACITY-EXPANDING
XFMR REPLACEMENT	• BI-DIR. CNTRLS • 3V0 INSTALL	• XFMR REPLACEMENT • BUS RECONFIG.	• XFMR UPSIZING* • BKR UPSIZING* • COND. UPSIZING*
SUBSTATION EXPANSION W/ XFRM REPLACEMENT	• BI-DIR. CNTRLS (x2) • 3V0 INSTALLATION (x2)	• XFMR REPLACEMENT • XFMR ADDITION • BUS RECONFIG.	• XFMR UPSIZING* (x1) • BKR UPSIZING* • COND. UPSIZING*
CIRC. REGULATOR BI-DIRECTIONAL CNTRLS	• BI-DIR. CNTRLS	• N/A	• REG. UPSIZING*
COSTS ASSIGNED TO:	DER CUSTOMERS	RATE-BASE	SPLIT

*Upsizing refers the increase or expansion in equipment size only (i.e., only the delta between old smaller and new larger equipment)

Table 1: *Benefits distributions for three example upgrade options*

STAGE II – Proactive Hosting Capacity Analysis

Once the benefits distribution for each upgrade option has been determined, engineers may now move onto the second stage – determining the cost allocation for capacity-expanding upgrades using a proactive hosting capacity analysis. Many jurisdictions today routinely publish conventional generation hosting capacity analysis (HCA) maps, and a growing number have started publishing load HCA maps as well, enhancing transparency and supporting planning efforts for both DER integration and load growth. Proactive hosting capacity analysis (PHCA) is an expansion of conventional HCA that evaluates grid constraints[1] under **future** system conditions. These future conditions include forecasted load and DER deployment scenarios and are shown in **Figure 1** below for both Load and Generation PHCA.

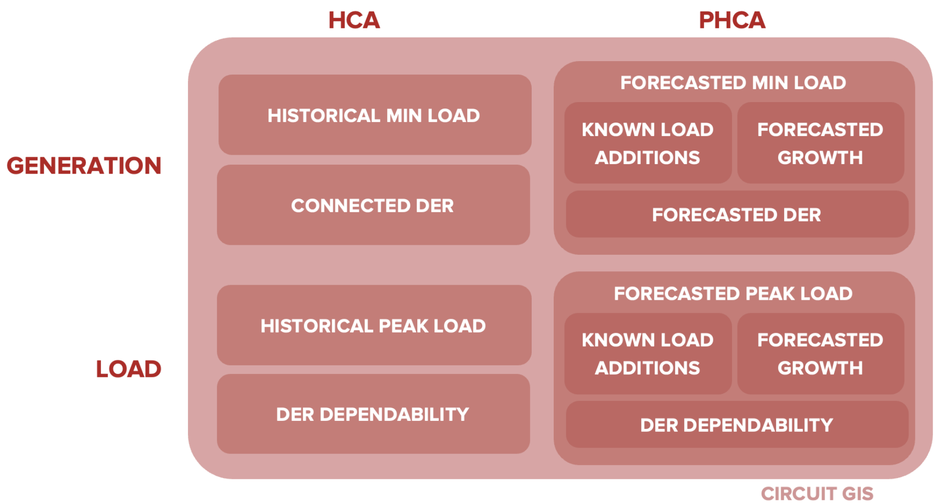

Figure 1*: Input differences between conventional and proactive hosting capacity analyses.*

Once deployed, both Load and Generation PHCA can be used in the proactive cost allocation process to determine how costs are split between DER-Customers and the Rate-Base for capacity-expanding upgrades. Essentially, PHCA will help determine what system constraints are exceeded by forecasted load or generation and by exactly how much, which can then be used to allocate costs. Before we walk through this process, there are several important points to consider:

Differences in Load PHCA and Generation PHCA – Different inputs are used to determine load and generation limits. Additionally, many utilities use different planning limits for generation versus load. Therefore, the thresholds determined for both L-PHCA and G-PHCA will more than likely be different. This also means that any given upgrade may provide a different amount of capacity for new load versus new generation.

DER Dependability in Forecasting is Essential to L-PHCA – DER Dependability refers to the informed inclusion of generation operating profiles, such as those of PV systems, into the load planning process in a systematic and conservative manner. While most planning processes entirely ignore generation when considering upgrades due to load growth, some jurisdictions, like Southern California Edison (SCE), have pioneered approaches to account for PV dependability. SCE's PV Dependability Methodology exemplifies how utilities can incorporate PV operating profiles into planning by assessing their reliable contribution during peak demand periods. This approach highlights the importance of integrating DER profiles into forecasting methodologies to improve accuracy in both the forecast and in grid planning.

[1] Hosting capacity is highly influenced by the selection of technical criteria and thresholds, which determine the grid's capacity assumptions and limitations based on constraints such as thermal, voltage, and protection criteria. Therefore, "regulators may want to exercise some oversight over the selection of the criteria and associated thresholds to ensure that they are appropriately (and not overly) restrictive" (pg. 24) (*See* Sky Stanfield, et al., Key Decisions for Hosting Capacity Analyses, Interstate Renewable Energy Council (September 2021), https://irecusa.org/our-work/hosting-capacity-analysis/).

Marginal Oversizing as a Standard Practice – Equipment is typically available in set sizes, not customized for each specific need. As a result, choosing equipment that meets the capacity requirement often means selecting a size slightly larger than what is strictly necessary. The goal of any cost-effective approach is to keep this extra capacity as small as possible. However, because of these fixed size options, the added capacity may sometimes go beyond what is actually required. To address this fairly and flexibly, PHCA focuses on the usable capacity added by an upgrade (or capacity enablement) rather than the equipment's total maximum capacity (nameplate rating), which may not reflect the true need.

The process of determining how Capacity-Expanding upgrade costs are allocated relies on recognizing the proportional capacity benefits that a given upgrade provides to either support new load or new generation. We define variables as **Enabled Load Capacity** and **Enabled DER Capacity**. **Figure 2** below is a visual representation of the proposed PHCA and Capacity-Expanding cost process.

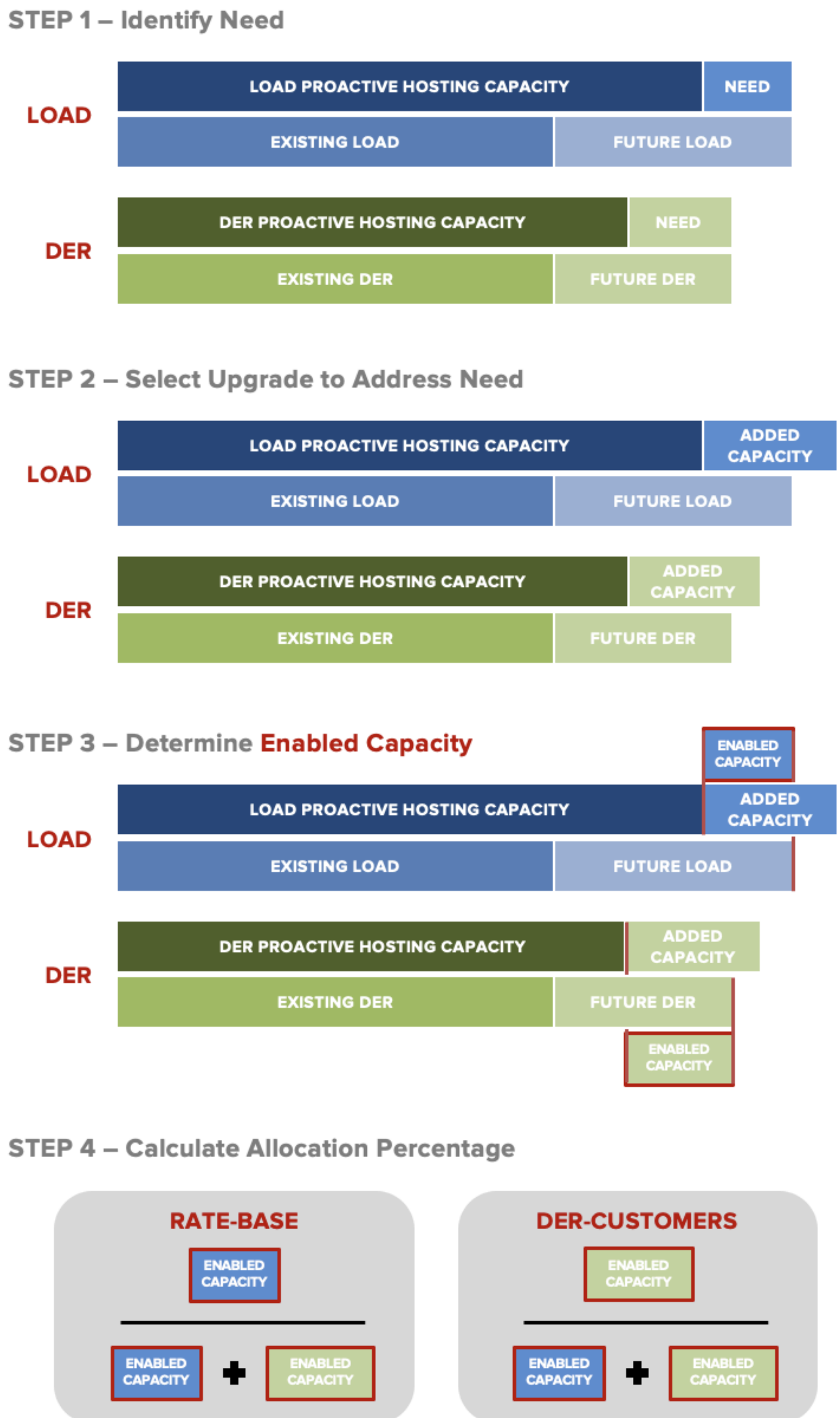

Figure 2: Capacity-Expanding Cost Allocation Process

As can be seen from this diagram, each group is only responsible for the proportion of the upgrade cost that will serve their forecasted growth. Depending on the region-specific forecasting trends, the allocation percentage will change between the DER-Customers and the Rate-Base. This ensures inherent flexibility within the allocation process.

STAGE III – Select Upgrade and Allocate Costs

Given that both our equipment benefit distributions and proactive hosting capacity thresholds have been determined, utility engineers now have all the information they need to examine upgrade options across their system and allocate their costs accordingly. To demonstrate this process in its entirety, let us walk through an example in which a utility is determining how to proceed with forecasted constraints on a given substation transformer.

I. **Benefit Distribution – Evaluating Substation Transformer Upgrade Options**

Previously, the utility determined the benefits distribution of each transformer upgrade option in their territory. Below is a sample of what they determined for the assumed 40 MVA transformer size most appropriate for this given planning scenario. Please note that the costs are only for demonstration purposes, however, they were informed by real utility unit costs guidelines.

Upgrade Option	DER-Enabling	Reliability-Enhancing	Capacity-Expanding
Like-for-Like Replacement (40MVA)	TOTAL: $500K BI-DIR CNTRLS ($100K) 3V0 INSTALL ($400K)	TOTAL: $2,500K XFMR REPLACE ($2,500K)	N/A
Upsizing (62.5MVA)	TOTAL: $500K BI-DIR CNTRLS ($100K) 3V0 INSTALL ($400K)	TOTAL: $2,800K XFMR REPLACE ($2,500K) BUS RECONFIG ($300K)	TOTAL: $1,900K XFMR UPSIZING ($1,500K)* BKR UPSIZING ($200K) COND. UPSIZING ($200K)
Upsizing + Redundancy (62.5MVA x2)	TOTAL: $1,000K BI-DIR CNTRLS ($200K) 3V0 INSTALL ($800K)	TOTAL: $7,500K XFMR REPLACE ($2,500K) XFMR ADD ($4,000K)** BUS RECONFIG ($1,000K)	TOTAL: $1,900K XFMR UPSIZING ($1,500K)* BKR UPSIZING ($200K) COND. UPSIZING ($200K)

*These are the costs for the upsized transformer above the cost of a like-for-like replacement
**XFMR addition is primarily for system redundancy, therefore considered reliability enhancing.

II. **Proactive Hosting Capacity Analysis – Determining Allocation of Capacity-Expansion**

The utility then performed a proactive hosting capacity analysis for circuits and substation in question to determine what system thresholds would be exceeded by forecasted conditions and by how much. This was then used to determine the capacity-expanding allocation percentage for each upgrade option

L-PHCA	Existing	Future	Need/Enabled	Allocation (%)
45 MVA	35 MVA	20 MVA	(35 + 20) - 45 = 10 MVA	10 / (10 + 2) = **83%**
G-HCA	**Existing**	**Future**	**Need/Enabled**	**Allocation (%)**
30 MVA	20 MVA	12 MVA	(20 + 12) - 30 = 2 MVA	2 / (2 + 10) = **17%**

III. **Select Upgrade and Allocate Costs – Evaluate Upgrade Options**

Review upgrade options once again, now with their costs distributed amongst Rate-Base and DER Customers. Present selection and cost ramifications to Commission.

Upgrade Option	Rate-Base	DER-Customers
Like-for-Like Replacement (40MVA)	**TOTAL: $2,500K** DER-ENABLING: N/A RELIABILITY-ENHANCING: $2,500K CAPACITY-EXPANDING: $0	**TOTAL: $500K** DER-ENABLING: $500K RELIABILITY-ENHANCING: N/A CAPACITY-EXPANDING: $0
Upsizing (62.5MVA)	**TOTAL: $4,377K** DER-ENABLING: N/A RELIABILITY-ENHANCING: $2,800K CAPACITY-EXPANDING: $1,577K *(83%)*	**TOTAL: $823K** DER-ENABLING: $500 RELIABILITY-ENHANCING: $0 CAPACITY-EXPANDING: $323K *(17%)*
Upsizing + Redundancy (62.5MVA x2)	**TOTAL: $9,077K** DER-ENABLING: N/A RELIABILITY-ENHANCING: $7,500K CAPACITY-EXPANDING: $1,577K *(83%)*	**TOTAL: $1,323K** DER-ENABLING: $1,000K RELIABILITY-ENHANCING: $0 CAPACITY-EXPANDING: $323K *(17%)*

Conclusion

Effective cost allocation is a cornerstone of equitable and efficient proactive grid planning, yet it poses significant challenges, particularly when upgrades benefit multiple stakeholders. IREC's proposed cost allocation framework addresses these challenges by leveraging proactive hosting capacity analyses to ground decisions in engineering realities while ensuring fair benefit distribution across customer types. By integrating a bottom-up, equipment-centric approach, the framework standardizes and simplifies the allocation process, making it both replicable and scalable.

While robust in its systemic approach, this framework leaves several critical questions open for further investigation and discussion:

- **Recovery Distribution:** How should the costs of system upgrades be allocated to future DER customers (e.g., location-based, system-wide, or other mechanisms)?
- **Equity Considerations:** What are the equity implications of this framework, such as potential rate impacts on already energy-burdened communities? How can costs be equitably distributed to projects sited, owned, or operated by disadvantaged communities without compromising future project feasibility?

This framework empowers utilities and stakeholders to accurately assess the benefits of distribution system upgrades while fostering transparent and equitable decision-making within integrated distribution planning processes. By aligning upgrade costs with their beneficiaries—whether load customers, DER applicants, or a combination of both—the proposed approach ensures that investments address system needs while balancing stakeholder interests and advancing equitable outcomes.