Dr. Brad Borum
Indiana Utility Regulatory Commission
101 West Washington Street, Suite 1500 East
Indianapolis, Indiana 46204 -3419

August 15, 2025

Re: Advanced Transmission Technologies in I&M's 2024 Integrated Resource Plan

Dear Dr. Borum,

Solar United Neighbors (SUN), Vote Solar (VS), Environmental Law & Policy Center (ELPC), and Citizens Action Coalition of Indiana (CAC) (Joint Commenters) respectfully submit the following comments regarding the role of the transmission system in I&M's 2024 Integrated Resource Plan. In particular, we recommend that the Commission direct the Company and other utilities to incorporate Advanced Transmission Technologies into their planning processes to enable greater access to cost-effective generation resources.

Advanced Transmission Technologies are hardware and software solutions that improve the efficiency, capacity, reliability, or safety of existing transmission infrastructure. As described below, by deploying Advanced Transmission Technologies to quickly and cost-effectively reduce grid congestion, the Company can increase the amount of new resources that can interconnect to its system by 2030. That will allow the Company to increase the "build limits" that constitute an important input into the IRP.

Joint Commenters note that in April, the General Assembly enacted Senate Bill 422, which requires that IRPs filed in 2026 and beyond include a description of investment in or potential use of Advanced Transmission Technologies. SB422 further supports the deployment of Advanced Transmission Technologies by directing the Commission to conduct a study of their potential use or deployment in the state. While we recognize that SB422 does not impose any

requirements with respect to the Company's current IRP, we believe the Company should not wait until the law's requirements kick in to begin adopting Advanced Transmission Technologies. Instead, the Company should proactively begin to incorporate Advanced Transmission Technologies into its planning processes in order to improve the efficiency and reliability of its system while reducing costs.

A. Advanced Transmission Technologies Increase Transmission Capacity and Efficiency in a Fraction of the Time as Building a New Line

The most commonly deployed Advanced Transmission Technologies are dynamic line ratings, advanced power flow controls, topology optimization software, and advanced conductors. *Dynamic Line Ratings* increase the capacity and reliability of existing transmission lines by providing real-time data about line conditions. *Advanced power flow controls* take advantage of excess transmission capacity by redirecting power flows onto underused portions of the transmission system. *Topology optimization software* identifies reconfigurations of the grid in order to reroute power around congested circuits. *Advanced conductors* replace the traditional steel core conductor—that is, the wire that transports electricity—with modern materials such as composite carbon fiber.

Utility experience demonstrates that Advanced Transmission Technologies can quickly and cost-effectively improve the performance and reliability of the transmission system. For example, a recent dynamic line ratings pilot project conducted by AES across five different transmission lines found that dynamic line ratings increased capacity on 345 kV lines by an average of 61% (over static line ratings) and 23% (over ambient adjusted line ratings).[1] AES also

[1] AES Corp., "Lessons From First Deployment of Dynamic Line Ratings," (April 2024), accessed on Feb. 11, 2025 at https://www.aes.com/sites/aes.com/files/2024-04/AES-LineVision-Case-Study-2024.pdf.

specifically found that deploying dynamic line ratings provided significant reliability benefits, including "improved situational awareness and an opportunity for informed decision-making."[2]

Similarly, advanced conductors have had success around the globe—as of 2023, "over 90,000 miles of advanced conductors have been deployed worldwide."[3] They are also widely deployed across the United States. One example from Texas shows the potential of replacing traditional conductors with advanced conductors. In an area of high load-growth, AEP replaced the traditional conductors on two parallel 345 kV lines with an aluminum conductor composite core (ACCC) conductor.[4] The reconductoring project doubled the capacity of the lines, reduced line losses by 40 MW and enabled the utility to keep pace with load growth without building a new line.

Because Advanced Transmission Technologies rely on *existing* transmission infrastructure and rights of way, they substantially reduce development time and cost. One of the most time-intensive aspects of transmission development is planning the route and acquiring easements on which to build the line. By eliminating that step, Advanced Transmission Technologies drastically reduce the time required to increase transmission capacity. Some technologies, like dynamic line ratings, take just a few months or even hours to deploy. Advanced conductors typically take 1-2 years to deploy on an existing line as a replacement for a traditional conductor, i.e. reconductoring.

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[2] *Id.*
[3] Emilia Chojkiewicz, et al., "Reconductoring With Advanced Conductors Can Accelerate The Rapid Transmission Expansion Required For a Clean Grid," GridLab (2024).
[4] CTC Global, *American Electric Power Doubles Capacity, Saves Time and Money*, https://ctcglobal.com/aep-reconductoring-case-study/ (accessed May 1, 2025).

B. Recent Federal Orders Demonstrate the Importance of Advanced Transmission Technologies for Building New Generation

In a number of recent orders, the Federal Energy Regulatory Commission (FERC) has made clear that transmission planners and operators should incorporate consideration of Advanced Transmission Technologies into their processes. First, in Order No. 2023, FERC recognized the value of Advanced Transmission Technologies (which FERC calls "alternative transmission technologies") for enabling more efficient interconnection of new resources.[5] Then, in Order No. 1920, FERC required transmission planners to incorporate Advanced Transmission Technologies into long-term planning, finding that they can enable cost-effective increases in grid capacity.[6]

Order No. 2023 was FERC's response to the long backlogs in interconnection queues that were "hinder[ing] the timely development of new generation."[7] The Order instituted major reforms to the process that transmission operators like MISO use to handle requests for new generation to connect to their systems. One part of those reforms was a requirement that transmission providers evaluate certain enumerated Advanced Transmission Technologies as solutions to any upgrades required to connect new resources to the grid.[8] The Commission explained:

> selecting alternative transmission technologies as network upgrades may reduce interconnection costs by providing lower cost transmission solutions to interconnecting new generating facilities and may allow for a faster interconnection by providing solutions that can be implemented more quickly. Commenters also point out that alternative transmission technologies allow for better use of the existing transmission system, can enhance reliability, and may reduce withdrawals, restudies, and overall interconnection delays.[9]

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[5] *Improvements to Generator Interconnection Procedures and Agreements*, 184 FERC ¶ 61,054, at ¶ 37 (2023) ("Order No. 2023").
[6] *Building for the Future Through Electric Regional Transmission Planning and Cost Allocation*, 187 FERC ¶ 61,068, at ¶ 1201 (2024) ("Order No. 1920").
[7] Order No. 2023, at ¶ 37.
[8] *Id.* ¶ 1578.
[9] *Id.* ¶ 1583.

Among other technologies, FERC required transmission operators to consider Advanced Power Flow Controls, transmission switching (one application of Topology Optimization, as noted above), and advanced conductors.

Order No. 1920 concerned regional transmission planning—the process by which RTOs like MISO plan for large transmission projects that have regional benefits. FERC directed the transmission planners to evaluate Dynamic Line Ratings, Advanced Power Flow Controls, transmission switching, and advanced conductors alongside new transmission lines when developing regional transmission plans. FERC found that:

> incorporating the enumerated alternative transmission technologies as upgrades to existing transmission facilities has the potential to make the use of existing transmission infrastructure more efficient and optimize the performance of such infrastructure, mitigating or deferring the need for development of new regional transmission facilities. Adding alternative transmission technologies to new regional transmission facilities may provide cost savings by improving operational efficiency of transmission facilities. Further, incorporating alternative transmission technologies into new transmission facilities may present more benefits and cost less than incorporating such technologies as retrofits after the regional transmission facility is deployed.[10]

The Commission also discussed each of the specific technologies, explaining the benefits of each. For example, FERC stated that "by accounting for actual wind conditions, dynamic line ratings can also reliably increase transfer capability and thereby provide reliability benefits."[11]

[10] Order No. 1920, at ¶1201.
[11] *Id.* ¶ 1241.

C. Advanced Transmission Technologies Could Resolve Bottlenecks, Increase Build Limits, and Allow for a More Cost-Effective Portfolio

One of the key inputs into the Company's IRP are the "build limits" that set a ceiling on how much of any resource the Company can add each year. For example, the IRP relies on a build limit of 500 megawatts of storage through 2030, as compared with a limit of 3,600 megawatts of combined cycle gas. The Company explains that these build limits "were developed based on a review of PJM's Interconnection Queue, market-based intelligence on the near-term availability of existing resources, and generation engineering expertise."[12]

Transmission constraints are a key factor in the amount of generation that interconnects through the PJM interconnection queue. Transmission bottlenecks limit the availability of interconnection sites and cause projects to drop out of the queue.[13] For that reason, increasing investment in transmission solutions in order to increase transmission capacity could allow for higher build limits than those the Company relies on in its IRP. Indeed, a 2023 study of interconnection in PJM found that Advanced Transmission Technologies could enable nearly 1,000 megawatts of new generation to interconnect in the PJM portion of Indiana by 2027.[14] That study did not include advanced conductors, which would likely unlock even more new generation.

Given the likely effect of Advanced Transmission Technologies on transmission constraints and build limits, Joint Commenters recommend that the Company incorporate these technologies into its planning. Where the extra generating capacity that an advanced transmission technology creates allows the Company to rely on more cost-effective resources,

[12] IRP at 87.
[13] *See, e.g.,* Katie Mulvaney et al., *Getting Interconnected in PJM*, Rocky Mountain Institute (February 2024), https://rmi.org/insight/analyzing-gets-as-a-tool-for-increasing-interconnection-throughput-from-pjms-queue/.
[14] *Id.*

the Company should adopt that technology solution. While SB422 does not require the Company to consider Advanced Transmission Technologies in its present IRP, the Company should begin to evaluate and deploy these technologies prior to the next IRP so that it is not starting from scratch.

SUN, Vote Solar, ELPC, and CAC look forward to working with the Company and other stakeholders in future IRP processes to ensure that I&M customers are able to fully realize the benefits of a clean, affordable, and equitable electric grid through accelerated deployment of Advanced Transmission Technologies.

Respectfully Submitted,

Solar United Neighbors
Vote Solar
Environmental Law & Policy Center
Citizens Action Coalition