From:	Doug Fasick
To:	Comments, Urc
Cc:	Kumar Menon; Matthew Wirtz
Subject:	Comments on HEA 1278 Energy Study
Date:	Monday, February 17, 2020 8:50:53 AM

Dear Mr. Heater,

Thank you Mr. Heater for allowing City Utilities of Fort Wayne to comment on the HEA 1278 tasked to conduct a study on the statewide impacts of transitions in fuel sources and other electric generation resources, as well as the impacts of new and emerging technologies on electric generation and distribution infrastructure, electric generation capacity, system reliability, system resilience, and the cost of electric utility service for consumers.

As a part of our review and considerations, there are several items worth noting that should be considered as a part of the study process.

- Advanced energy encompasses a broad range of technologies, products, and services that constitute the best available technologies for meeting energy needs today and tomorrow. In recent years, behind-the-meter distributed energy resource (DER) technologies have emerged as an additional means of producing power, managing electricity demand, and providing valuable grid services. These resources are smaller, flexible, located within load centers, typically connect to the distribution grid and are capable of decreasing net electricity demand either by injecting power locally and/or by reducing demand.
- Currently, DERs are not considered for their potential contributions to the grid in open, transparent transmission and distribution (T&D) planning processes and generally are not allowed to participate as supply resources in Regional Transmission Operator (RTO) markets. Planning processes and market rules have been designed for large generators and industrial customers, and thus present barriers to DER participation. By functionally excluding DERs from consideration, Indiana is forgoing opportunities to lower consumer costs that arise from allowing DERs to compete and in some cases complement side-by-side with traditional generators and T&D solutions.
- In the past 20 years, the grid and the technologies for generating and managing energy have evolved substantially. A larger share of generation is variable and, as a result, operators increasingly have less control over supply resources. By contrast, the ability to manage flexible loads and behind-the-meter DERs is expanding rapidly. Indiana has a substantial amount of existing DERs and the penetration of connected devices, battery storage, distributed solar, energy efficiency, and other advanced technologies are expected to grow. However, absent changes to make the T&D planning process more transparent and competitive and to allow third-party participation in wholesale energy markets, the benefits of incremental DER resources will be untapped. The status quo leaves considerable resources and efficiencies untapped, limiting competition, and leading to higher costs for Indiana consumers. Ultimately, competition and markets will determine the magnitude, location, and mix of DERs.
- One of RTO’s core functions is to balance supply and demand at all times. Historically, due to the cost of storing electricity, reliability has been ensured by sizing infrastructure so enough electricity can be produced and delivered when demand use is forecasted to be at its highest

—peak demand. The amount of generation and transmission capacity is typically tied to the RTO's system peaks, while distribution capacity is based on location-specific peak demand connected to the relevant substation, feeder circuit, line segment, or transformer. This general approach has served us well for many years. However, planning and operation of the electric grid are evolving due to rapid technological change. In recent years, DERs have emerged as an additional means of producing power, managing electric demand, and delivering grid services. These resources are smaller, flexible, located within or near load centers, typically connect to the distribution grid and are capable of decreasing net demand (as seen by the bulk power system) either by injecting power locally or by reducing demand. DERs include a broad range of technologies – including distributed solar, battery storage, thermal storage, customer-owned generation, connected devices such as smart thermostats, electric vehicles, demand response, and energy efficiency.

- DERs have the potential to influence all aspects of electricity grid infrastructure, including electricity generation, transmission, and local delivery. They are capable of providing a broader array of grid and energy services than bulk power generation and transmission equipment or distribution network equipment. The ability to impact both the bulk power system and the local distribution system stands in contrast to investments such as large-scale generators, transmission lines, and distribution transformers.
- Each DER technology has a unique set of characteristics and operating constraints, but because of their modularity, DER portfolios can be tailored to meet a range of energy and infrastructure needs. They can be customized to deliver the exact amount of energy and/or capacity needed at a given location and can serve multiple needs. In many cases, DER portfolios can offer more cost effective solutions than expanding traditional infrastructure. By injecting power into the distribution grid or reducing demand, DERs can reduce, defer, and sometimes avoid the need for T&D investments. DERs can also increase available capacity when the net system load and prices are high and produce power, provide grid balancing, or operating reserves to help the Indiana electric grid function.
- DER portfolios are currently being used in multiple jurisdictions to reduce, defer, and avoid T&D infrastructure expansion driven by growth in local peak demands.[1, 2] This application of DERs to target periods when the system is at or near peak conditions is often referred to as non-wire solutions (NWS), and the T&D deferral value is often simply called the locational value of DERs. Multiple factors drive the locational value of DERs, including the magnitude of growth-related T&D investments, peak load growth rates, the amount of existing T&D capacity available to accommodate additional growth, and the expected deferral period.
- The key questions that need to be asked as we review this study should include:
    1. How do DERs reduce T&D expansion costs?
    2. How much does Indiana spend on T&D infrastructure?
    3. What share of T&D costs are growth related and avoidable?
    4. How long can DERs defer T&D infrastructure investments?
    5. What is the value of T&D deferral in Indiana?
    6. How sensitive are the results to input assumptions?
- T&D infrastructure investments occur for several reasons, including replacement of aging or failing equipment, the need to improve reliability, the connection of new buildings to the electric grid, grid modernization, and connecting new generation. Many of these investments cannot be avoided and must take place. However, as a general rule, infrastructure expansion

due to peak load growth can be reduced, deferred, or avoided by reducing local peak demand through either injecting power locally or reducing demand using DERs. As loads grow, the distribution capacity cushion that ensures reliability dwindles. If a customer helps reduce coincident peak demand (i.e., when the local distribution system peak occurs), either by injecting power into the distribution grid or by reducing demand, the unused distribution system capacity can then accommodate load growth elsewhere in the local system. Transmission expenditures are often driven by growth in overall system peak demand and corresponding congestion. On a more local scale, growth-related Subtransmission and distribution expenditures are driven by specific load pockets with expanding population or economic activity, rather than evenly across a service territory. When the use of existing T&D infrastructure is prolonged by managing peak demand, Indiana consumers save money. Effectively, the utilization of existing capital-intensive assets is improved while investments in new assets are deferred or avoided. T&D capital projects are identified during utility planning processes, but these processes are not always publically available, and the selected T&D solutions typically do not compete against alternatives. There are no price signals to drive competition. Often, the decision to build distribution infrastructure is not subject to regulatory approval directly as regulators make approvals in rate cases, but don't oversee individual projects. Once investments are made, the T&D capital costs are generally amortized over the life of the capital equipment, converted into revenue requirements, and collected through rates.

- Deferral or avoidance of T&D capital expenditures thus translates directly into reduced rate pressure for consumers. It also allows utilities to assess better if peak load growth at a given location is a temporary phenomenon or a long-run trend before making irreversible, multi-decade investments.
- The magnitude of T&D expenditures varies by state and utility and is driven by a mix of population growth, economic growth, and technology adoption. In assessing T&D expenses, it is crucial to distinguish between historical and potential future costs. By definition, costs for historical investments are sunk and have already been approved and incorporated into electric rates. These investments cannot be avoided or deferred. In contrast, future investments can be reduced, deferred, or avoided. Nevertheless, past expenditure trends can help inform estimates for future investments.
- As noted earlier, not all T&D investments are tied to load growth or otherwise avoidable. Key examples include system maintenance, replacement of aging or failed infrastructure, and grid modernization investments (e.g., sensors, smart meters, data recording and transmittal, automated load transfer switches). Moreover, not all investments due to load growth are avoidable. For example, new home construction often requires connecting customers, adding distribution line segments, adding transformers, and connecting sites. Even if an existing substation can service the added load, some T&D investments are required. While many utilities report on overall expenditures, few utilities separately report costs driven primarily by peak demand growth. This data limitation creates a challenge for identifying the portion of investments which are growth-related and avoidable. Growth-related investments tend to range from about 10% to 30%.
- The ability to defer T&D investments – and, thus, avoid new costs – is tied to the rate of peak demand growth and the magnitude of DER resources that can be added to a location. More resources enable utilities to avoid growth-driven infrastructure for more extended periods.

However, when peak demand is growing at a rapid pace, it is difficult to avoid or defer infrastructure upgrades by managing peak demand. When the pace of growth is moderate or low, it is possible to defer infrastructure upgrades for longer periods and, in some cases, avoid them altogether.

- The T&D deferral potential represents a cap on the DER locational value. In practice, DERs are not cost-free, but substantial savings can be attained by allowing them to compete with traditional solutions. DERs create value beyond locational value, including grid resilience (which is critical during hurricanes), cleaner air, more competition, and customer savings. The potential T&D benefits of DER, however, will not occur without an initiative to integrate DER into T&D planning and create transparent, competitive processes that explicitly consider non-wires solutions. Another option is to make modifications to distribution utility rate designs to reflect DERs benefits or to develop other mechanisms to support DER deployment. In order to avoid or defer distribution investments, incremental distributed energy resources need to be procured in advance at the right locations and target the right hours. The magnitude of DERs introduced also needs to be large enough to prolong the use of existing equipment. Thus, to unlock the locational value of DER resources, it is necessary to identify the high-value locations so DER resources can be concentrated.
- Specifically, we recommend establishing processes to:
    - Identify locations that are highly loaded (e.g., loading factor above 90%);
    - Define the magnitude and timing of resources needed for each forecast year;
    - Collect competitive bids for DER resources (nonwire solutions); and
    - Implement the least cost solution, whether it is a DER solution or an expansion of the T&D system.

[1] https://nyrevconnect.com/non-wires-alternatives/

[2] https://sepapower.org/resource/non-wires-alternatives-case-studies-from-leading-u-s-projects/

Again, thank you for the opportunity to review and comment on this very important issue.

Best regards,

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