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NET METERING AND DISTRIBUTED ENERGY RESOURCES POLICY

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INTRODUCTION

On July 16, 2020, the Federal Energy Regulatory Commission (FERC) denied a petition for declaratory order submitted by the New England Ratepayers Association (NERA).[1] In its petition, the NERA claimed that Net Energy Metering (NEM) was a wholesale transaction and subject to FERC jurisdiction.[2] As such, the petition asked the FERC to assert jurisdiction over all NEM sales across the country—except for the majority of Texas, Hawaii and Alaska, which are not subject to federal jurisdiction. If the NERA petition was successful—and the FERC asserted jurisdiction—it would likely have ended the state-level experiments with NEM and made it more difficult for states to develop programs on their own. However, in denying the petition, the FERC noted that the NERA did "not identify a specific controversy or harm that the Commission should address in a declaratory order to terminate a controversy or to remove uncertainty."[3]

Although the FERC denied the NERA petition on procedural grounds, the proceeding raised issues at the core of NEM policy that will likely result in increased scrutiny of future policy at the state level. For years, utilities have argued that NEM resulted in unfair cost shifts between customers and over-compensated the excess electricity. While not necessarily wrong, the purpose of NEM is to promote alternatives to monopoly provided electricity and to enable policy goals that support growth of solar electricity; it should not be seen as the only option available to policymakers. Indeed, the transition toward a new model is already underway, but much groundwork remains.

NEM EXPLAINED

Net Energy Metering (NEM) is a mechanism adopted by nearly every state to compensate excess electricity generated by small resources, such as solar, located on or close to the distribution grid.[4] This mechanism is subject to review by state electricity regulators to ensure that the compensation satisfies state policy objectives. The review is based on an analysis of the costs and benefits of the program, which is then used to determine the cost-effectiveness of the methodology. In some cases, compensation is based on the avoided cost of the monopoly utility from providing the same or similar service; in other cases, compensation is based on the current retail rate of electricity. In either case, determinations are developed by the state regulator and based upon a record. The regulator's decision is then subject to appeal.

NEM is part of a broader evolution of the electricity system toward smaller, distributed energy resources (DER).[5] These resources—such as solar, energy efficiency, demand response and small energy storage—may reduce overall customer demand from the electric system and provide services back to the retail and wholesale system where allowed. This reflects a significant change from the historical way electricity has been provided, planned and operated. With this change, however, comes opposition to policies that would enable greater utilization of smaller, local resources and compensation for those resources. In particular, NEM has been the focus of opposition by distribution utilities who claim there are cost shifts from participating customers to non-participating customers, and that NEM over-compensates for the excess generation put back onto the grid.[6] NEM supporters note that utilities fail to account for system benefits due to NEM, such as avoided or deferred infrastructure and capacity costs and reduction in carbon and environmental quality attributes.[7] What both sides fail to address, however, is that NEM is a step toward a more transparent and open accounting for the costs and benefits of DER, and an emerging distribution-level market.

At its core, NEM is a price set in response to a regulatory process to compensate excess generation from distributed solar. However, the regulator cannot know the costs at every substation or transformer across the system at all times of the day. In the absence of that information, the regulator does the best job it can to develop a price that is representative of the costs and benefits across the system, but costs and benefits from DER are not uniform and vary by time and location. In this regard, the NERA is correct to identify potential inequities with NEM. The NERA is incorrect, however, in its argument that these transactions fall under FERC authority. These transactions are appropriately before the states, as costs and benefits from NEM predominately accrue to the distribution system and retail customers.[8]

NEM is part of this transition away from large, centralized fossil-fueled power plants. States have made the decision to provide policy preferences for resources such as solar by enacting specific policies, such as NEM. NEM poses two ratemaking challenges: ensuring that costs are not inappropriately shifted between and amongst customer groups and that benefits are greater than costs. This shift is a matter of scale—states with low participation in NEM will have less impact on this cross-subsidization than states with higher participation. Utility efforts around the country have largely focused on eliminating or weakening NEM regardless of actual harm or impact. Those states that have seen an increasing amount of NEM participation have begun to transition away from the original NEM program design. In order to realign NEM in response to a successful program, states can make several adjustments such as changes to the retail rate design or participation requirements.[9] For example, California and Hawaii have both made changes in response to significant participation in prior NEM programs. California currently requires customers to be on a time-of-use rate to be eligible for NEM.[10] Hawaii changed its NEM tariff by closing its NEM program and created a new tariff that changes the compensation by crediting the customer's bill by a fixed rate that differs by island, rather than compensating the customer at the retail rate. Hawaii also created a separate tariff to provide compensation for controllable solar and storage systems that exports excess electricity during non-daytime hours. Furthermore, both California and Hawaii have moved forward on requiring the use of advanced inverter functionality for new solar installations. The advanced inverter can mitigate operational concerns by, among other things, better managing total energy and quality output from the solar installation before it is put into the distribution system.[11]

MOVING FORWARD

A better way to determine DER value would be based on true, local, marginal costs through the development of a value of DER tariff or, in the longer term, the ability to generate a real-time price at the distribution level. These prices, however, require significant investment by the distribution monopoly to provide greater visibility into the real-time operation of the distribution grid. The prices and information about the distribution system, such as hosting capacity, would then need to be made available to customers and developers. New generation will likely exacerbate system constraints where capacity is unavailable, but storage (or energy efficiency or demand response) could alleviate capacity constraints. Without visibility into the system, developers do not know where to locate resources that can support the system rather than increase costs and pose reliability risks. As it is currently constructed, NEM does little to compensate or encourage developers to locate those optimal areas. For example, NEM typically does not include a locational value component. Existing utility distribution planning activities also do not adequately account for the capabilities of DER to provide benefits to the distribution system, or where to locate them.

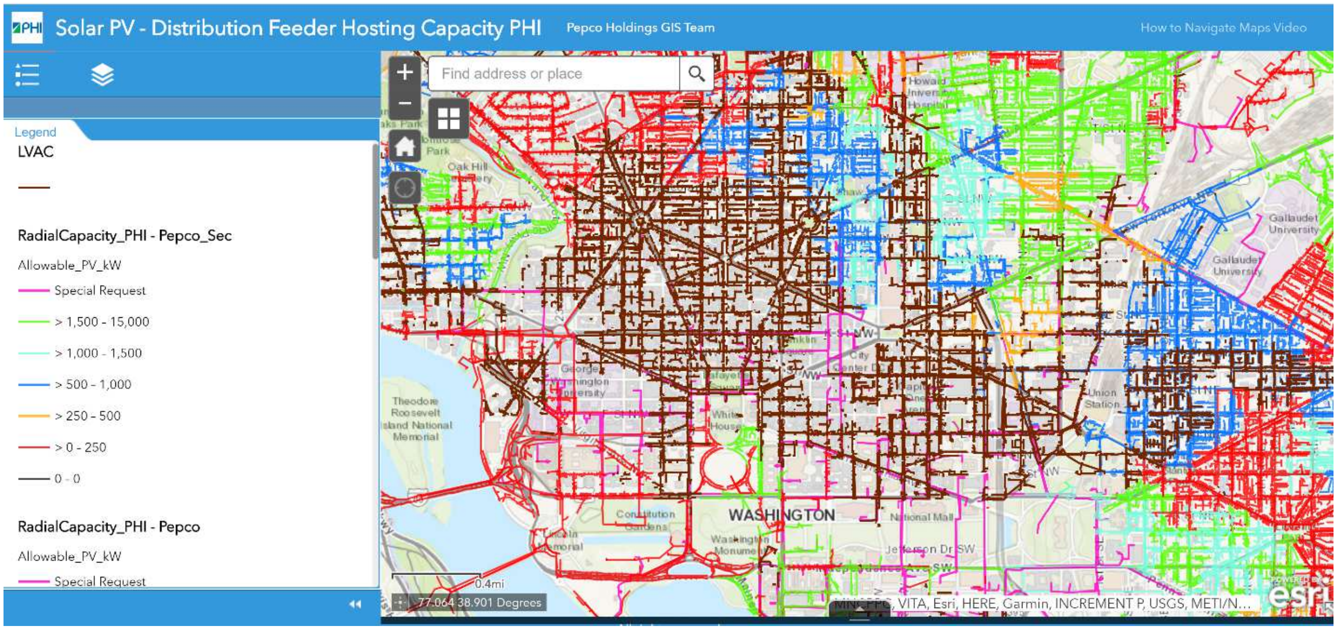
Information about the distribution system is vital to ensure that DER is located in areas where they provide benefits, or at least do not increase costs. The distribution utility is the only entity with information about the system and the potential to identify locations and generate price signals. Understanding adoption rates for solar and participation in NEM programs can help guide state action on when it is appropriate for an NEM program to be modified—or eliminated entirely—and on when to transition customers onto the next stage of DER compensation. This transition will require states to take on several initiatives that the following sections discuss in greater detail.

Hosting Capacity

According to the Electric Power Research Institute, hosting capacity is: "[T]he amount of [rooftop solar] that can be accommodated without impacting power quality or reliability under existing control and infrastructure configurations."[12] A number of state commissions around the country have started to consider hosting capacity due to its ability to identify areas across a distribution system where solar and storage would be beneficial and the value it provides to the development of solar and storage markets. Figure 1 shows an example of a hosting capacity heat map.

Figure 1 (below) is a map of the PEPCO system that serves Washington, D.C. It provides a color-coded visualization of areas where there is available capacity for solar and areas where there is no capacity.[13] By looking at this map, a developer would be able to identify locations that would have a higher likelihood of interconnecting with the distribution utility. Additionally, this map is available to the public—without a login, registration process or other security requirements—which facilitates the market development for DER and brings transparency to utility system operations.

FIGURE I: WASHINGTON, D.C. HOSTING CAPACITY HEAT MAP



SOURCE: PEPCO Hosting Capacity Map.

Interconnection Reform

All resources that seek to inject electricity into the system or be compensated for some service, such as NEM, must go through an interconnection process, which includes the policy and technical details that a resource must satisfy in order to safely interconnect with the system. On the distribution side, those processes are done at the state level. Many states have a rule that covers all utilities, but some states operate on a utility-by-utility basis. While a statewide rule would provide more efficiency and transparency to the process, it is more important that whatever interconnection rule is in place today is updated to reflect changes to the underlying technical standards. Recently, the Standard for Interconnecting Distributed Resources with Electric Power Systems (IEEE 1547-2018) was updated to allow for the use of advanced inverter functionality.[14]

Resources like solar and storage require an inverter to safely interconnect with the distribution system. Solar and storage typically produce or store electricity in Direct Current (DC), but our electric system operates in Alternating Current (AC). So, the inverter switches the current from DC to AC in order to safely put electricity back on to the system. The advanced inverter allows the solar and storage to provide additional services that were not previously available, such as voltage ride-through, which allows for the resource to stay online during short voltage fluctuations outside the standard operating norms. These services will allow solar and storage to be better utilized at the local level to solve problems on the distribution side.

Interconnection reform also involves updates to interconnection processes, which include: submitting interconnection requests online; having the utility provide a public queue so applicants can see where they are in the process; harmonizing the screening process, which allows certain projects to be expedited where there is sufficient hosting capacity; and providing a clear and repeatable process for interconnection itself.[15] Each of these features are important aspects of a modern, interconnection process—one built on more transparency to make it efficient for the developer and the utility to process interconnection requests in a timely manner.

Distribution System Planning

The last component that a state should consider in response to the growth of DER is the distribution utility's system planning process. The distribution system will facilitate and enable the growth and use of DER, but this will require substantial investment, as many parts of the current system were installed in the 1960s, or earlier. While the rest of the world has moved to 5G wireless, this part of the system still runs on technology from when the rotary phone was considered advanced. In order to run a hosting capacity map, the distribution utility needs real-time visibility into its system, and data analytics to take the information and turn it into something usable and actionable for the customer and developer. Distribution system planning looks at the current capabilities, the state of the distribution system and the utility planning process and identifies a vision; it then develops a pathway for what investments are needed to realize that vision.[16] If a state sees the role of DER growing and seeks to better utilize those investments for grid services, distribution system planning would identify the technologies needed to enable that use and then create a timeline and strategy for the necessary capabilities to ensure that these investments are interoperable and support one another.[17]

Distribution investments are fully within the authority of state commissions. In rate cases, commissions may consider the total budget, but may not always dig into the technology choices and strategies of utilities. However, going forward, understanding the distribution system planning process at the utility will be important to ensure that the grid is being properly invested in at the appropriate scale, and in a way to support and utilize DER as they come online.[18]

If a state considers and implements these three initiatives, it will be on a path to identify the necessary information to transition to whatever comes after NEM. Without visibility into the distribution system, a regulator—and the market—will not know where to locate DER in places where there are benefits. Without interconnection reform, DER will not be able to interconnect quickly and use the services enabled by an advanced inverter. Without distribution system planning, the regulator and the utility will not know where and when DER is coming online because they do not have the appropriate technologies needed to operate the system effectively and efficiently.

CONCLUSION

The United States has over 3,000 electric utilities, and jurisdiction is shared between state and local governments and the federal government. This arrangement has been largely successful and allows each authority to focus on the area most important to it: the FERC oversees areas that impact interstate commerce and wholesale market design, while the states and local governments focus on the needs of their residents and localities.[19] States and utilities have different policy goals, have made different technology choices in the past and represent the interests of their populations. Trying to impart a one-size-fits-all regime onto the distribution system and into the states is an exercise in futility. After all, the United States has seven regional transmission organizations—each one is unique and representative of its members. Similarly, each state is unique and representative of our union. Within each state are cities and utilities with regulators who ensure that those utilities act in ways that provide a reliable service at a reasonable rate and do not take advantage of customers by exercising monopoly power. This freedom to innovate, try, fail and try again is a hallmark of our system.

At the end of the day, NEM is what we have, but it is not perfect. Much like the distribution system today—which is in need of modernization—NEM has been around for over two decades in some places and now needs an update. What that looks like is appropriately before the states, as they are the ones best suited to understand the distribution system, develop appropriate retail rates and compensation mechanisms, and respond to changes in consumption from retail customers. The three steps recommended above are tools that a regulator can use to inform itself as it navigates this necessary evolution.

ABOUT THE AUTHOR

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ENDNOTES

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