

Distributed Energy Resources

Summary

In a shift from the traditional electric power paradigm, utilities and utility customers are installing distributed energy resources (DERs), including distributed generation (DG) facilities that employ small-scale technologies to produce or dispatch electricity closer to the end use of power. Driving this exponential growth is the dramatic decrease in the price of DER technology, as well as state, federal, and utility incentives for DER installations and state renewable portfolio standards/clean energy standards. Use of DERs may offer numerous benefits, including avoided generation capacity costs (e.g., less need to build new generation), avoided transmission costs, less need for backup power, and reduced air emissions, but it may also pose operational and economic challenges to electric utilities and their customers.

The American Public Power Association (APPA) believes that DERs can play an important role in helping meet energy needs and achieving environmental goals so long as customers pay their fair share of the costs of keeping the grid operating safely and reliably. However, rate design and regulatory requirements for DERs must take into account a utility's technical limitations and geographic considerations. APPA also believes that DER implementation policy and rate design are matters of state and local retail regulation and therefore Congress and federal agencies should refrain from imposing federal standards, such as mandating that DERs be allowed to participate directly in wholesale electric markets without the consent of state and local regulators.

Background

DERs include demand response, efficiency programs, and other demand-side management tools, as well as DG resources, such as solar photovoltaic installations, small wind turbines, combined heat and power, fuel cells, micro-turbines, and storage

devices (e.g., large lithium batteries or grid-connected electric vehicles (EVs)). Use of DERs may reduce the need for new utility generation assets and ancillary services, allow utilities to avoid higher transmission costs by reducing peak demand, reduce air pollution emitted by traditional fossil fuel-fired generation, and assist utilities in hedging against widespread power outages. Despite these potential benefits, DERs may also create operational and economic issues for electric utilities and power customers, each of which should be addressed at the local and state level.

For example, too much DG can create excess demand at a substation, causing power to flow from the substation to the transmission grid and increasing the likelihood for high voltage swings and other stresses on electric equipment. DG may also threaten lineworker safety. One such example is "islanding," when the DG continuously energizes a feeder even though the utility is no longer supplying power due to an outage or other cause. In addition, DG is more difficult to monitor and may impact load forecasts. Finally, DG-owning customers may introduce additional operational complexities for transmission, distribution, and generation systems more than non-DG-owning customers. Utilities will have to make capital investments to address these potential strains on the system, and these costs may be borne by both DG-owning and non-DG-owning electric customers.

Increased DG use may cause economic issues as well. For example, subject to applicable state or local laws, most electric utilities compensate DG producers through net metering. Under a net-metering program, a utility will credit customers with on-site generation for their kilowatt-hour (kWh) sales to the grid and charge them for periods when electricity consumption from the grid exceeds their generation (or the net difference between consumption and generation). Under many net-metering programs, the customer is both charged and credited at the utility's full retail rate of electricity, thus potentially over-compensating distributed generators with a value of generation

that is higher than the utility's avoided cost. Some states and non-regulated utilities have designed alternative compensation schemes to appropriately value the full costs associated with DG production, including increased customer charges for fixed costs, residential demand charges according to peak kW usage, time-based pricing, and standby rates. Additionally, some utilities have developed net billing or buy-all, sell-all arrangements where excess solar generation is compensated at an avoided cost, wholesale, or value-of-solar rate. Still, some regulators (states, localities, and non-regulated utilities) have not implemented compensation schemes that properly account for certain fixed charges, and this may create an economic burden for both utilities and power customers. Community solar projects owned, in part, by consumers of the electricity produced by these facilities, may allow utilities to more accurately apportion costs and reduce variability on the system, thus addressing several of the issues associated with using solar DG. These economic issues may also arise in the future with the growth of storage and EVs.

These reliability, operational, and economic challenges may be even more severe if DERs are permitted to participate in wholesale electric markets without the consent of state and local regulators. APPA raised this concern in response to the Federal Energy Regulatory Commission's (FERC) 2018 rule allowing electric storage resources located on the distribution network or even behind a retail customer meter to participate in organized wholesale electricity markets without the consent of state and local regulators. The association, along with state regulators and other electric utility trade groups, challenged this aspect of FERC's storage rule in federal appeals court on jurisdictional grounds. However, in July 2020, the court denied the appeal, concluding that state and local regulators cannot use their authority over local distribution systems to broadly prohibit storage resources from accessing wholesale markets. The court did recognize that state and local regulators retain broad authority over the distribution system, which might be legitimately used to restrict wholesale market access in certain cases, including for safety or reliability purposes.

In its Order No. 2222 issued in September 2020, FERC adopted additional rule changes to facilitate DER participation in organized wholesale markets. While the new rules raise jurisdictional and practical concerns arising from such wholesale market participation, FERC significantly mitigated these concerns for most APPA members by establishing an "opt-in" mechanism for small utilities under which DERs located on small utility systems may not participate in organized wholesale markets without the consent of the state or local regulator.

Congressional Action

Several bills related to DERs were signed into law as part of the Energy Act of 2020, which passed Congress in December 2020 as part of an omnibus appropriations and COVID-19 relief package. Specifically, the Energy Act of 2020 included provisions from the Better Energy Storage Technology (BEST) Act (S. 1602/H.R. 2986), which supported research, development, and deployment of energy storage technologies, including by authorizing an energy storage demonstration pilot program for which public power utilities are eligible. The Energy Act of 2020 also authorized an energy storage and microgrid technical assistance program for public power and rural electric co-operative distribution utilities. Additionally, the bill reauthorized the Department of Energy's (DOE) Solar Energy Technology Program, Office of Wind Energy, and geothermal research and development programs. In total, the Energy Act of 2020 authorized over \$35 billion in DOE research and development programs.

The Infrastructure Investment and Jobs Act (H.R. 3684), which was signed into law in November 2021, authorizes and appropriates additional funding for several Energy Act of 2020 programs, including appropriating \$355 million for energy storage demonstration grants and \$150 million for long-duration storage demonstration. It also reauthorizes and appropriates \$3 billion annually for fiscal years (FY) 2022-2026 for the DOE Smart Grid Investment Grant Program, which provides grant funding for utilities to deploy various grid technologies, including investments that enable the integration of DERs and electric vehicle-to-grid technologies. APPA supports these programs that will help public power utilities continue to invest in new and innovative technologies.

In addition, the new infrastructure law includes a "must-consider" requirement under section 111(d) of the Public Utility Regulatory Policies Act (PURPA) that will direct state public utility commissions and non-regulated electric utilities to consider measures to promote increased demand response activities by commercial, residential, and industrial consumers. Given the time and expense required of public power utilities to comply with new PURPA 111(d) requirements, APPA did not support including this provision in the new infrastructure law.

APPA Position

APPA believes that DERs can and should play an important role in public power's energy portfolio, and it supports member utilities' efforts to safely and effectively install and facilitate the use of DERs. To continue fostering the growth of DERs, APPA believes that it is important that all customers pay their fair share of the costs of keeping the grid operating safely and reli-

ably. Thus, rate structures should be designed to reflect costs and assure that those who benefit from the grid are sharing the costs associated with building and maintaining it. Because community solar projects may address several issues associated with DG usage, APPA supports this type of ownership structure for solar DG facilities. The association opposes attempts by the federal government to nationalize rate design and distribution-related matters that have traditionally been governed by state and local laws. Finally, APPA believes that FERC should recognize the authority of state and local regulators to determine whether DERs on the distribution systems they regulate should be permitted to participate in FERC-regulated wholesale electricity markets.

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The American Public Power Association is the voice of not-for-profit, community-owned utilities that power 2,000 towns and cities nationwide. We represent public power before the federal government to protect the interests of the more than 49 million people that public power utilities serve, and the 96,000 people they employ. Our association advocates and advises on electricity policy, technology, trends, training, and operations. Our members strengthen their communities by providing superior service, engaging citizens, and instilling pride in community-owned power.