AMERICAN PUBLIC POWER ASSOCIATION
Powering Strong Communities

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Critical Infrastructure And Supply Chain Constraints

The U.S. economy has been deeply impacted by supply chain constraints. These constraints are due to shortages of labor and multiple classes of materials, causing disruptions on a global level. For public power utilities, the ability to provide reliable and affordable power to homes, businesses, and critical facilities is foundational to both their business model and the recovery and expansion of the U.S. economy. Prioritization of critical electric infrastructure and the electric industry's critical functions during this period of material shortages and delays is necessary to prevent further economic slowdown and ensure electric reliability.

Supply of critical equipment and materials is decreasing while demand continues to grow, widening the gap between what is available and what is needed.

Electric utilities are experiencing shortages of distribution transformers, smart meters, conductor materials, skilled labor, and other necessities due to the economic impacts from the COVID-19 pandemic. Delayed investments and expanding lead times for new equipment caused by a lack of materials and labor will continue to compound the problem—possibly for years to come.

As the economy rebounds from the impacts of the pandemic, additional electric capacity is needed to power new residential and commercial development, new manufacturing facilities, and to support a rapidly expanding electric vehicle fleet. Public power utilities are investing heavily in clean energy technologies to meet environmental goals. Simultaneously, the industry is facing extreme weather events, which have become more frequent and severe, requiring more resource-intensive response and restoration.

Distribution transformers and other materials are in critically short supply.

Distribution transformers are essential for electric utilities to expand capacity, provide electricity to new communities, and restore service when existing infrastructure is damaged during a hurricane, winter storm, or other natural disaster. In a recent survey of public power utilities, 80 percent reported having either pad-mounted or pole-mounted distribution transformer inventories that are lower today than they were in 2018. The median percent of distribution transformers companies have this year compared to 2018 is down by 25 percent. Some companies have only 10 to 15 percent of the number of transformers they had four years ago.

Lead times to purchase new distribution transformers have risen from three months in 2018 to an extraordinary 12 months or more today. Utilities have relied on their existing inventory of transformers and other measures to bridge the gap between equipment purchase and arrival but have begun to report that their buffer inventories are decreasing to unacceptable levels. Assuming no changes to the current situation, 21 percent of surveyed public power utilities could run out of new transformers within the quoted 12-month lead time needed for newly purchased equipment to arrive.

Prolonged supply chain constraints on critical electric infrastructure could be detrimental to the U.S.

As hurricane and wildfire season approaches, maintaining a sufficient inventory of critical equipment for emergency response and restoration is especially important. The historically severe grid impacts of Hurricane Laura in 2020 and Hurricane Ida in 2021 combined with increasingly urgent supply chain constraints have

left electric utilities with depleted and decreasing transformer inventories, raising concerns about the feasibility of responding to and recovering from another severe storm season, even with a robust mutual aid program in place.

Supply chain constraints, particularly shortages of distribution transformers, have caused electric utilities to delay or cancel infrastructure projects that would require more resources than are available. Many of the industry's planned projects are designed intentionally to transition to cleaner energy resources, and significant construction delays have the potential to put the nation's clean energy objectives at risk. Already the transformer shortage is impacting the housing market, with construction companies being required to use generators long-term to keep their job sites powered while utilities look for transformers to feed new electrical load.

To ensure that supply chain constraints do not impact reliability, utilities are taking extraordinary measures to meet current demand with the limited supply of equipment that is available, including refurbishing older equipment and identifying swapping equipment in the field to generate spares from underutilized equipment. These are last-ditch efforts to protect the safety of electric customers and sustain other sectors that depend on electricity, but these efforts move the industry further away from clean energy, efficiency, and affordability goals.

Utilities are discussing the issue with the federal government, working with manufacturers, and with the entire sector to encourage additional production and sharing of transformers.

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