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Putting a Price on Resilience Could Lead to More Solar+Storage

New analysis finds that placing a monetary value on power outage losses can increase the size and number of economically viable solar+storage projects

Montpelier, VT – Findings presented in a new paper by the U.S. Department of Energy’s National Renewable Energy Laboratory (NREL) and Clean Energy Group (CEG) show that more integrated solar photovoltaic (PV) and battery storage projects could make economic sense if the value of avoiding power outages is taken into account in project economics.

Based on in-depth modeling of various building types, putting a real value on the ability of PV and storage to prevent losses during outages results in the cost-effective design of larger solar+storage systems. In some cases, putting a value on resilience can even make solar+storage projects feasible where the technologies would not be economically viable otherwise.

It is often a challenge for building owners to put a value on expected losses from power outages. There is no clear market value for energy resilience, and, while a data center or bank may be able to put a dollar value on anticipated losses due to outages, it is extremely difficult for most organizations to place a monetizable value on resilience-related investments. This is particularly true for facilities providing services that a community depends on in an emergency situation, like hospitals, first responders, and shelters. As a result, the economic value of avoiding these losses (that is, the value of energy resilience) is generally not factored in when owners are making investment decisions. As a result, PV and battery storage may be deemed too expensive, even though disasters and power outages result in billions of dollars of losses to the economy.

CEG and NREL’s new paper, [Valuing the Resilience Provided by Solar and Battery Energy Storage Systems](#), looks at three building scenarios in Anaheim, California: a school, an office building, and a hotel. For each of these customer types, two scenarios were explored – one placing no value on resilience and one valuing resilience in terms of dollars lost per hour of outage. These resilience values are based on customer survey data from a previous study by researchers at the Lawrence Berkeley National Laboratory.

By applying this methodology to quantify the cost of outage-related losses for different customers over typical outage durations reported by the utility serving Anaheim, Southern California Edison, this paper illustrates the impact that placing value on resilience has on these types of technology adoption decisions. In each case analyzed, larger PV and battery storage systems are found to be economical when the value of resilience is accounted for.

The results are particularly striking for storage, resulting in positive economics for battery systems in the office and hotel that would not make sense without including the value of avoided outages. This also increases the total lifetime savings realized by the building owner. Incorporating the value of avoided losses for the hotel results in more than a doubling of net benefits, an increase of \$178,000 over the lifetime of the system. For the school, adding in the value of resilience results in a battery system that is thirteen times larger than what would be recommended if resilience were assigned no value, again doubling net savings for the building owner.

This analysis is particularly timely in light of recent major weather events and the widespread power outages that followed. These extreme events, such as Hurricane Maria in Puerto Rico, have raised awareness of the need for better resilient power solutions, as many diesel generators were found to provide limited support due to equipment failures and fuel shortages.

“As the findings in this paper suggest, avoiding outages with resilient solar+storage can deliver significant value to many types of customers,” said Seth Mullendore, coauthor of the paper and vice president and project director at CEG. “By placing a value on resilience now, more solar+storage could be deployed before the next big storm hits. This is important for businesses, but even more essential to the safety of our most vulnerable populations, like the sick and the elderly, where access to power could literally mean the difference between life and death.”

Even with the rapid decline in PV and battery storage prices over the last few years, solar+storage installations have remained largely limited to areas with favorable utility rate tariff structures or accessible market opportunities. Because there is no accepted method for incorporating the value of avoided power outage losses into project decisions, the resilience is currently not an economic driver of such systems.

The analysis detailed in this paper demonstrates that, in most cases, valuing resilience will increase the size, and viability, of both PV and battery storage. By placing a value on outage-related losses, solar+ storage could make economic sense in many more locations today, ensuring more communities are better prepared for the next disaster.

Read the full report at: www.cleanegroup.org/ceg-resources/resource/valuing-resilience-solar-battery-energy-storage

NREL and CEG will host a webinar on Wednesday, March 14 to discuss the findings of the report, as well as energy resiliency in the broader context and considerations for designing a solar+storage system that can contribute to energy resiliency. For more information on this free webinar and to register, visit www.cleanegroup.org/webinar/valuing-resilience-solar-battery-energy-storage.

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About Clean Energy Group

Clean Energy Group is a leading national, nonprofit advocacy organization working on innovative technology, finance, and policy programs in the areas of clean energy and climate change. Clean Energy Group also manages the Clean Energy States Alliance (CESA), a coalition

of state and municipal clean energy funds. The Resilient Power Project, a joint initiative of Clean Energy Group and Meridian Institute, is designed to help states and municipalities with program and policy information, analysis, financial tools, technical assistance, and best practices to speed the deployment of clean, resilient power systems in their communities. For more information, visit www.cleanegroup.org and www.resilient-power.org.

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