# NREL tool finds effective behind-the-meter energy storage configurations

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The Energy Department's (DOE) National Renewable Energy Laboratory (NREL) has used the Battery Lifetime Analysis and Simulation Tool (BLAST) to confirm that energy storage for demand-charge management can deliver attractive economic benefits. The analysis paired recent utility rate structures with historic data on solar photovoltaic electricity generation and commercial facility loads to evaluate 6,860 unique scenarios. The results revealed that, in the absence of incentives, small battery systems reducing peak demand by 2.5 percent offer the most attractive return on investment.

Demand charges can account for more than 50 percent of a commercial customer's monthly electric bill. Analysis conducted using the Behind-the-Meter (BTM-Lite) version of BLAST computed peak load reduction and electricity cost savings while also identifying energy storage system configurations that deliver the most favorable return on investment in the shortest time possible.

"Batteries for demand-charge reduction are most cost effective under today's rate structures when configured for higher power-to-energy ratios, targeting discharge durations from 30 minutes to one hour," NREL Energy Storage Task Leader Jeremy Neubauer said. "State or utility incentives are often necessary to make longer duration, lower power-to-energy ratio systems more attractive."

Developed by NREL and funded by the Energy Department's Office of Energy Efficiency and Renewable Energy, the full suite of BLAST tools

makes it possible to predict long-term performance of batteries and identify possible improvements in a wide range of applications, including in electric vehicles (BLAST-V) and stationary energy storage (BLAST-S). BLAST BTM-Lite is available for free download. It can also be paired with NREL's Battery Ownership Model to assess lifetime battery costs in conjunction with performance, longevity, and new value propositions.

Provided by National Renewable Energy Laboratory