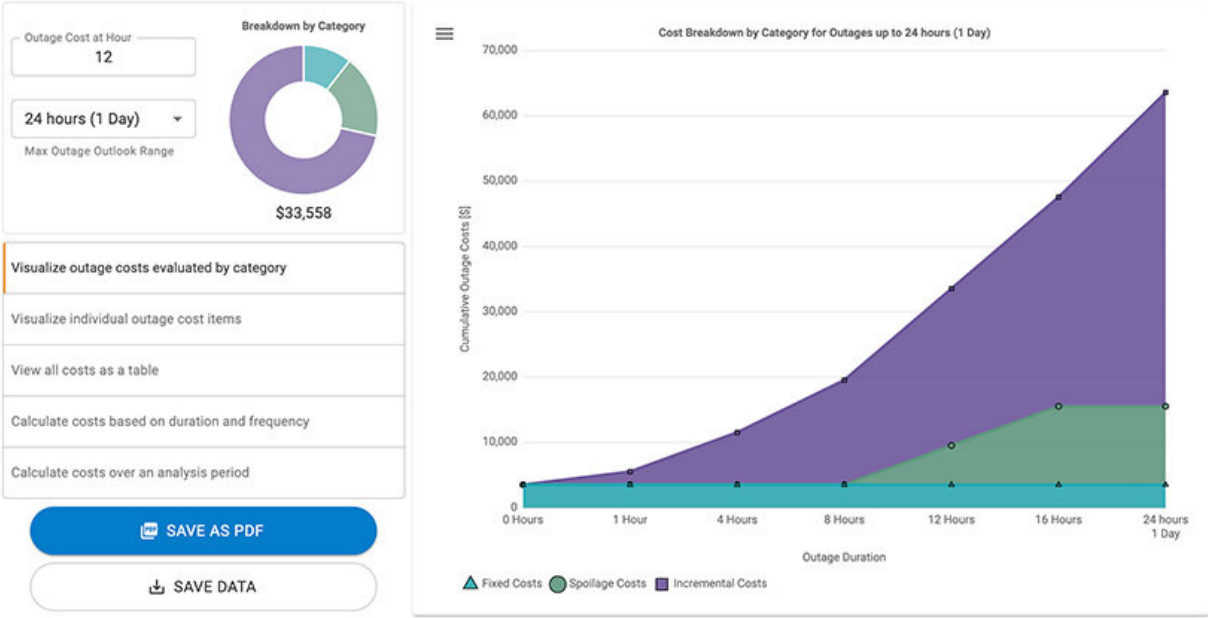


New customer damage function calculator estimates costs of an electric grid outage

September 14 2022, by Courtney Hausler



The CDF Calculator provides a customized breakdown of outage costs incurred by a facility for outages of various durations. Credit: National Renewable Energy Laboratory

Power outages can incur significant costs: lost data, diminished worker productivity, spoilage of perishable food, suspension of output and sales, disruption to critical services, and more. Understanding these potential costs can help facilities justify smarter investments in resilience.

Researchers at the National Renewable Energy Laboratory (NREL) are helping federal facility owners and [resilience](#) planners more easily estimate electric grid outage costs at their sites using the [Customer Damage Function \(CDF\) Calculator](#)—a free, publicly available resource.

The CDF Calculator helps highlight facility outage vulnerabilities and estimates how costs vary with different power outage durations. It is the first step in determining the potential avoided costs associated with resilience investments. Users can calculate the monetary benefits of a redundant (backup) system, providing justifications for enhancing resilience and informing [decision-making](#) based on the cost of inaction.

NREL researcher and financial analyst Sean Ericson understands the value of resilience. "Decision-makers face many challenges and have limited resources to address them," he said. "Resilience research informs the decision-making process by highlighting which risks are most important to address."

NREL researcher Nicholas Gilroy sees a compelling need for an accessible planning tool such as the CDF Calculator. "Agencies are looking forward to the future. At a site-based level, facilities can face unprecedented downtime. By illustrating cost and impact via the CDF Calculator, agencies can prioritize investments to mitigate risk and improve resilience," he said. "We developed a web-based tool that provides a responsive and modern interface to support federal [decision-makers](#)."

FEMP director Mary Sotos said, "We look forward to working with other federal agencies to raise awareness of the CDF Calculator's capabilities and helping agencies understand how resilience can be valued in facility planning and operations."

Applications of the tool

Although a variety of potential applications are possible, the CDF Calculator is primarily designed to help [federal agencies](#) address two use cases:

Federal Facility Decision Support: By illustrating cost and impact via the [calculator](#), agencies can generate monetary values to justify investments in mitigation and resilience solutions that can help prevent or lessen the impact of a grid outage. These outage costs can help site or headquarters leadership champion resilience investments and help contracting officers think about resilience goals in distributed energy resource project procurement—just two examples of how the calculator can support federal energy decisions.

Screening Tool: The CDF Calculator is the first step in determining the potential avoided costs associated with resilience investments. Once a baseline of outage costs is identified, an organization can look to the REopt web tool or the Technical Resilience Navigator tool to develop a risk-informed resilience framework for an entire site, campus, or installation, or to build out a specific potential solution, such as a microgrid.

Using the calculator

The CDF Calculator web tool can be used by:

- Building owners, energy managers, and energy consultants seeking to understand the cost of impacts associated with a [power outage](#) at their site
- Utilities in understanding the costs of outages at customer sites
- Insurance industry experts estimating compounded costs of outages over time
- Researchers or procurement specialists investigating the

economics and benefits of resilience investments.

How it works

- **Input Facility Data:** Enter general information and characteristics about the site being assessed. Provide details about total and critical electrical loads.
- **Estimate Costs:** Estimate different types of outage costs (i.e., fixed, spoilage, and incremental) incurred by the facility for [power outages](#) of various durations.
- **Review the CDF:** The calculator automatically populates results allowing for the adjustment of [outage](#) durations and frequencies based on the facility's geographic location.

Provided by National Renewable Energy Laboratory

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