



# Demand Charges 101

## **Why invest in demand reduction?**

Peak demand charges make up the most expensive part of your energy bill. Adopting a demand reduction strategy using solar and storage allows you to manage these excessive energy costs and gain a competitive advantage by significantly reducing your business's operating expenses.



# Demand Charges 101

## Why invest in demand reduction?

Peak demand charges make up the most expensive part of your energy bill. Advanced technology now allows you to manage these excessive energy costs and gain a competitive advantage by significantly reducing your business's operating expenses.

## Key Points



### WHAT ARE DEMAND CHARGES?

For large electric users, monthly energy bills consist of two parts:

- 1) Basic energy charges for the total amount of electricity used throughout the billing period and
- 2) Demand charges for the highest electric usage or "peak demand."



### WHY WORRY ABOUT DEMAND CHARGES?

Demand billing can account for 30-70% for a large electric user's utility bill. Many Midwestern states like Iowa pay some of the highest peak demand rates in the nation, seriously impacting the operating costs of your business.<sup>1</sup>



### CAN I ELIMINATE DEMAND CHARGES?

You can reduce or eliminate expensive peak demand charges with a combination of solar and AI-powered energy storage, which charges batteries when the sun is shining, and discharges the stored energy during times of peak energy use.

## Utility Charges Explained

### *How are utility bills are structured?*

Utility bills are built around tariffs. A tariff defines the electric rates, billing structures, and other charges that combine to form a bill. Electric rates may be charged per kilowatt-hour (kWh) for consumption or per kilowatt (kW) for demand.

The most common billing structures are flat, tiered, time-of-use, and demand. Additional charges usually include meter fees, delivery fees, and taxes. Flat, tiered, and time-of-use billing structures charge for energy consumption – how many kilowatt-hours of electricity are used in each billing cycle.

### *Consumption charges*

The most basic energy charges are consumption charges (also known as energy charges), where a customer is charged for the amount of electricity consumed over a billing period, measured in kilowatt hours (kWh). All utility customers, including residential, pay these basic billing charges.

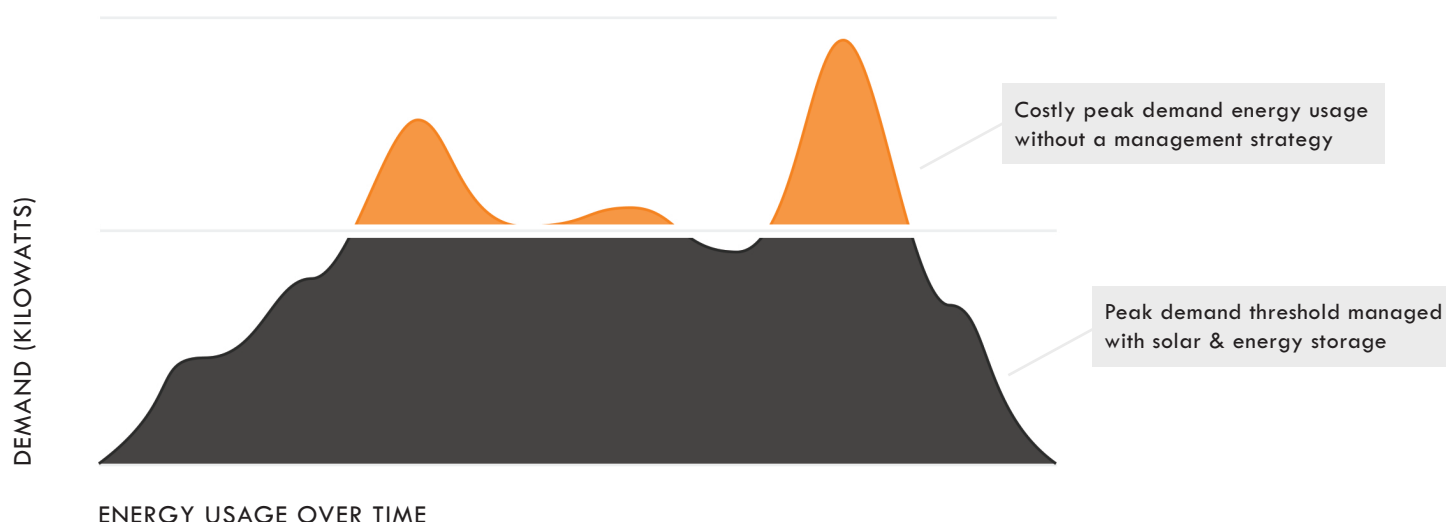
### *Demand charges*

Demand charge billing is different. With demand charge billing the customer pays for the highest power load reached – the peak demand. Demand charges are calculated by multiplying the peak demand rate by the highest power load reached in peak demand interval, usually 15 minutes, in each monthly billing cycle. For example, if a commercial customer hits a peak load of 150 kW during a particular month, and the demand fee is \$20/kW, then the demand charges for that month are \$3,000.

Customers with demand charge billing structures pay for consumption, too. These consumption charges are usually low compared to consumption charges in tariffs that do not include demand charges. For these demand customers, the benefit of demand charge billing is that consumption charges are low. The drawback, particularly for customers with high peak loads or unpredictable peaks, is that demand charges can present large expenses that are difficult to manage.

<sup>1</sup>National Renewable Energy Lab, Identifying Potential Markets for Behind-the-Meter Battery Energy Storage: A Survey of U.S. Demand Charges (August 2017), available at <https://www.nrel.gov/docs/fy17osti/68963.pdf>

## PEAK SHAVING WITH SOLAR & STORAGE



### Taking Control of Demand Charges with Peak Shaving

#### *Who pays demand charges?*

Any large consumer of energy will likely pay demand charges. This includes small businesses with large energy needs, as well as large manufacturing and industrial operations. It also includes non-profit organizations such as educational institutions, faith-based organizations, community facilities, public buildings, and multifamily housing properties.

#### *How can demand charges be reduced?*

The most effective way to manage utility costs for customers with demand charges is a practice called peak shaving. Peak shaving involves proactively managing overall demand to eliminate short-term demand spikes, which set a higher peak. This process lowers and smooths out the peak, reducing the overall demand cost.

Solar on its own or energy efficiency measures are often not enough to address peak demand mitigation. Battery storage, when coupled with solar energy, becomes a dispatchable energy resource and can be strategically charged and discharged throughout a billing period to manage electricity demand.

The above illustration demonstrates "peak shaving" using solar and energy storage technology. The battery energy storage system is charged by solar when the sun is shining, and can be discharged to maintain power from grid electricity below a certain threshold, thereby lowering peak demand.

#### *AI-optimized energy storage*

The new generation of advanced energy storage is outfitted with monitoring software featuring AI-powered algorithms, which learn when to store and dispatch energy based on utility rate structures, energy usage patterns, and weather events which may interfere with solar production.

Based on industry analysis and current battery system pricing, solar and storage can make economic sense for customers facing demand charges of \$15/kW or higher.

#### *Implementing a peak shaving strategy*

Utility demand charges are complex and can be difficult to understand. Demand charge rates vary according to utility, location, energy consumption pattern, and building type. Peak demand is derived from how and when each customer uses electricity, so two customers consuming similar amounts of electricity may incur vastly different demand charge expenses depending on their peak demand.

Ideal Energy simplifies this process with an in-depth analysis of each customer's utility tariff structure, occurrence of peak demand, location, and type of operation. Based on our analysis we design a comprehensive solution designed to maximize return on investment (ROI). We use UL-certified energy storage technology from the highest quality Tier 1 suppliers best suited to the customer's peak demand reduction requirements.

Are you paying excessive peak demand charges?  
Find out if solar & storage can help with a free assessment.

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