Electricity Savings by Reducing Demand

Introduction

As an industrial customer there are two separate items that contribute to the total cost of your electrical utility bill: Energy Charge and Demand Charge. Understanding the differences between these charges is the first step in decreasing your company's electricity cost. To help understand, it's helpful to use the analogy of a car getting from point A to point B. Thinking of energy charge as the total distance travelled and the demand charge as the top speed reached while in the car.

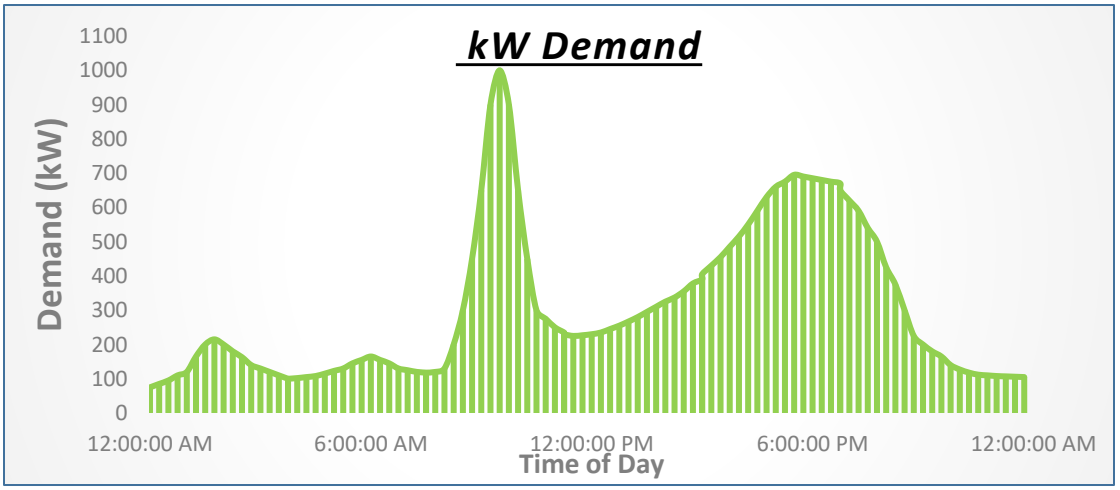
The Energy Charge, also known as the consumption charge, is based on the total amount of energy used by your company during the month. In the article we will focus mainly on the second charge on your bill, the Demand Charge.

DEMAND CHARGE	=	**MAX INSTANTANEOUS POWER USE (kW)**	X	**DEMAND CHARGE RATE ($ / kW)**

The Demand Charge is based on the maximum amount of power your company has required at any given time during the month, analogous to the top speed you may have attained while driving, for example. The utility charges you for this maximum power amount, even if it only happened once and for a short period of time. For this reason, it's important to install substation metering, allowing you to observe exactly when and how your facilities consume energy.

Example

To better understand how metering can provide useful and potentially cost-saving information, take a look at the following graph:



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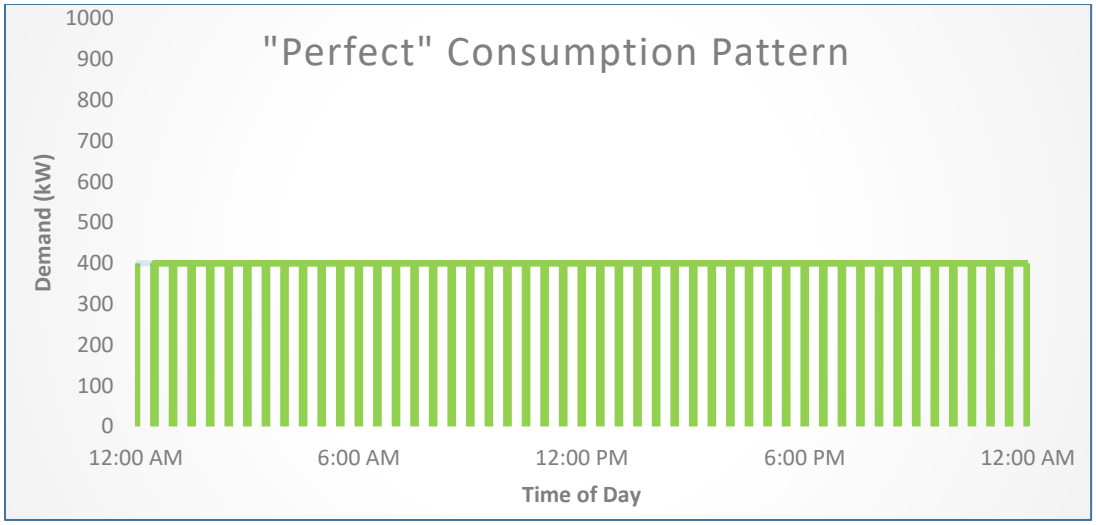
The above graph shows how a company may consume energy on a typical day. Here two major peaks are noted at 1000 kW and 700kW. Even though the 1000 kW peak is sustained for only about one hour, this company's demand charge will be based on this highest peak for the entire month, regardless if it occurs daily or once per month.

Additionally, monthly demand charges for large industrial electricity customers will be a minimum of 90% of the highest demand that occurred in the winter months of December to March. For example, even if a peak demand of 1000 kW occurred on one day in January, every other month of the year will be charged for a minimum of 900 kW of demand.

So how can this company save on energy-costs?

In theory, a company could bring its demand charge to a minimum by spreading out it's entire energy consumption equally every day of the year:



While this is great in theory, it isn't actually possible as industrial processes make use of a variety of equipment, at varying times and each with its own power requirement. Fortunately, while controlling loads to eliminate peaks in demand may be very difficult, there is another solution to reduce your demand.

BACK-UP GENERATOR

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TRANSFER SWITCH WITH PEAK SHAVING CAPABILITY

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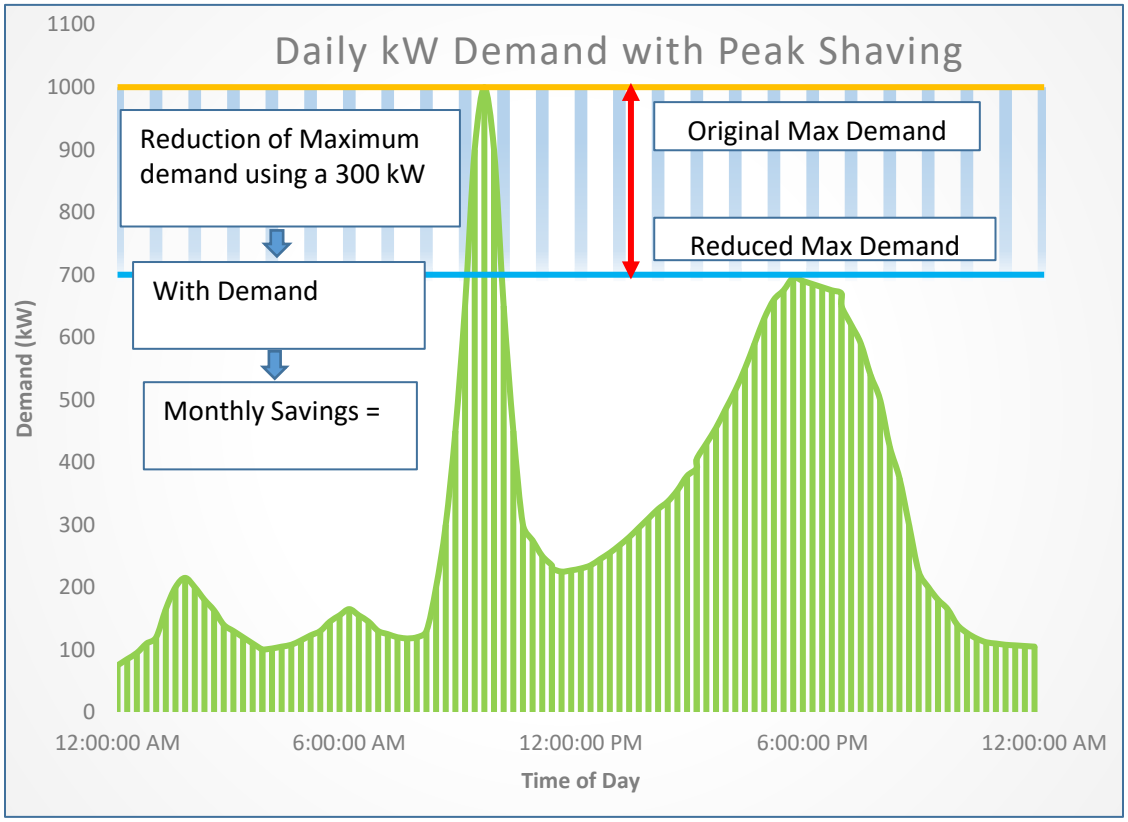
Many facilities, including commercial and government buildings make use of back-up generators to ensure power supply to essential parts of their system in case of power outages. What many don't know is that existing transfer switch installations used to connect these generators can be upgraded to feed power even while the grid is online. This lowers the demand the utility sees from your facilities during times of peak consumption, thus lowering your demand charge. Taking the previous consumption graph as an example:



As mentioned above, for large industrial electricity customers reducing a peak demand that occurs between the months of December and April will provide cost-savings for every other month of the year afterwards for even more cost saving opportunity.

The NB Power Large Industrial demand rate is $14.55/KW.

A demand charge of $14.55 per KW reduced by 1000 KW is $14,550 in savings in 1 month. The large industrial rate schedule applies 90% of the KW demand in Jan, Feb, March, Dec to all 12 months in the year. Which means **KW demand savings can be achieved in remaining months without operating the generator.**

A reduction of the KW demand by 1000 KW in 1 winter month can provide **savings of $158,595 in 1 year!**

$14,500 + 11 x 90% x $14,500 = $158,595

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The NB Power Small Industrial demand rate is $7.14/KW + 7.30 cents / kwh x 100kwh / KW demand which amounts to $14.44 / KW demand rate.

Additional benefits to upgrading transfer switch installations include:

- Load transfer from the utility to the generator and from the generator back to the utility is done seamlessly, without the need for electrical and costly process interruptions.
- Modern switchgear is often safer, more reliable and reduces maintenance costs.
- Replacement controllers offer better, more customized system protection settings.
- Replacement controllers offer automatic and remote control & monitoring.

For further information, feel free to contact your Power System Specialist: Power Precision.

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