Load Factor

Load factor can be defined as the average electric load divided by the peak (maximum) load in a specified time period. In other words, load factor is an expression of how much energy was used in a time period, compared to how much energy would have been used during a period of peak demand. Load factor is a useful indicator for describing the consumption characteristics of electricity over a period of time.

Calculating Load Factor

Load factor can be calculated by dividing the total kilowatt-hours (kWh) consumed in a certain period of time by the maximum demand in kilowatts (kW) and the number of hours. In the example below, the monthly kWh consumption is 50,000 and the peak demand is 100 kW. There are 30 days in the example's billing period and 24 hours in a day.

$$\text{Load Factor} = \frac{50{,}000\ kWh}{100\ kW \times 30\ days \times 24\ hours/day}$$

$$= \frac{50{,}000\ kWh}{72{,}000\ kWh}$$

= 69% load factor

This load factor indicates the monthly energy consumption of 50,000 kWh was 69% of the total energy available (72,000 kWh) for use at the 100 kW level.

Load Factor Significance and Improvement

The demand rate structure billing provides incentive for members to improve their load factor. Because load factor expresses electrical energy usage compared to peak demand, members can have the same amount of kWh usage from one month to the next and still cause their average cost per kWh to decrease by reducing the peak demand. This can be done by distributing energy usage over time to decrease peak demand.

Accordingly, decreasing peak demand is the best way to improve load factor and reduce monthly payments for electricity. To determine possibilities for improving load factor, examine billing records for periods during which the peak demand is the highest and determine what can be done to decrease demand during that time. It is also beneficial to observe operations at the facility to determine what equipment may be causing peak demand. Once contributing equipment loads are identified, it can be determined what can be done to schedule events or processes to minimize the simultaneous operation of high usage equipment.


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