

# Understanding Electric Demand



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# Electric Demand

Understanding the way you are billed for electrical energy may seem confusing. That's because, unlike some other products, electrical energy cannot, in a practical sense, be stored. Rather, it needs to be generated and supplied as your equipment calls for it. Day or night, we must instantly be able to meet your requirement for electricity. Your demand for electricity, and the flexibility needed to supply this electricity during peak times leads to "demand charges."

## What are Demand Charges?

LIPA must have generating stations, transmission wires, and substations on constant standby ready to meet your energy needs. This equipment must be sized to meet the maximum amount of potential electricity that customers may require, or, in other words, the "peak period demand."

The equipment needed to respond to peak demand is extremely expensive. While some commercial customers may need this equipment only intermittently, others need it almost constantly. Most customers fall somewhere in the middle. In order to distribute the costs associated with meeting peaks, utilities utilize separate charges for demand for large residential customers and most commercial customers.

Although it's often thought that most residential customers are not assessed demand charges, the rate they pay is actually a combination of consumption and demand charges. This one charge is more economical to implement.



## Demand vs. Energy

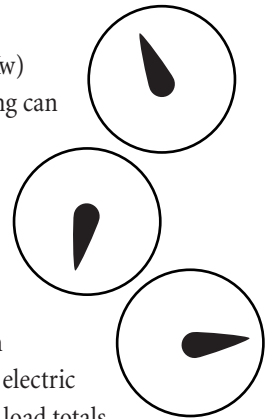
The distinction between demand (Kw) metering and energy (KwH) metering can best be illustrated with an example.

This example also shows the difference in unit electric costs between an efficient and inefficient user of electricity.

Suppose you operate a building with lighting, cooling, and miscellaneous electric equipment. The maximum installed load totals 120 kilowatts (Kw). Assume that the demand rate is \$10.65 per Kw, and the energy rate is \$0.092 per kilowatt hour (KwH). You are not using the building and have no employees. However, on the first day of each month you turn on all electrical equipment — all 120 Kw — for 15 minutes. Afterwards, you shut everything off and leave until the following month.

What will your monthly electric bill reflect? It would note very little energy use, only 30 KwH, (120 Kw multiplied by .25 hours), and would cost about \$2.76 (30 KwH multiplied by \$0.092 per KwH). However, your demand charges are for 120 Kw and would cost \$1,278 (120 Kw multiplied by \$10.65 per Kw) – resulting in a monthly bill of \$1280.76. Of course, this is an extreme example of an inefficient user of electricity. It does, however, show the significant difference between energy use in KwH and demand use in Kw.

Let's consider another example wherein the same building operates on a standard 40-hour week. The monthly energy use increases to 19,200 KwH (120 Kw multiplied by 160 hours per month), which would cost \$1,766.40. However, demand would remain at 120 Kw and the cost at \$1,278. The total monthly bill would be \$3044.40.



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## Recording Demand

Demand is measured over a 15 minute period. If a building is using 120 Kw for a 15 minute interval, the recorded demand would be 120 Kw. If the building was using 120 Kw for the first 10 minutes of an interval, and then completely shut down for the next five minutes of the interval, the recorded demand would be 80 Kw.



Although the electric meter measures demand over 15 minute intervals, it stores only the highest 15 minute period recorded during the billing period. This reading is used to compute demand charges on your electric bill (subject to a minimum demand charge explained later in this brochure under “Ratchets”).

After the meter reader takes your monthly reading, the meter is reset to zero and the meter begins recording for the next monthly period.

As an incentive to control demand costs, it's important to understand that your meter only records coincidental demand for the peak 15-minute period in the month. That means you can control your electric costs by staggering the use of different equipment. For example, if you were to simultaneously operate a 45 Kw machine and a 75 Kw machine, you would record 120 Kw on the demand meter. However, if you were to alternately operate these machines, the maximum reading would only be 75 Kw because the 45 Kw unit only operates when the 75 Kw unit is off and the meter only stores the highest demand. With interlocks and controlling devices, it's easy to operate some equipment this way.

Remember, each Kw saved in this example is worth \$10.65 per month. In this case it amounts to \$479.25 per month. We currently have customers with large equipment that are able to take advantage of such savings. However, there are many others who could be saving but aren't.

## Controlling Demand

A microprocessor load control system (LCS) is an excellent way to control demand for very large commercial/industrial loads. This system automatically monitors and controls demand, thereby reducing its level. Available in a variety of sizes, LCSs often pay for themselves in a relatively short period of time.

Because the demand meter only records coincidental demand, it's also possible to reduce heating, ventilation and cooling (HVAC) demand by using several units to meet the building's needs. If HVAC units are widely dispersed, they turn on and off at irregular intervals. This limits coincidental demand.

Probably the best (and most affordable) way to control electric demand lies within the building's thermal design. Tight construction, good window design and adequate, but not oversized, ventilation systems all conserve energy. Consequently, smaller equipment can be installed at lower costs and with reduced operation and demand charges.

## Ratchets

Sometimes there may be a difference between the recorded demand taken from the meter and the demand charges billed. This difference is due to a billing feature known as a



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“Demand Ratchet.” The Demand Ratchet creates a minimum seasonal demand charge stating that the minimum billed demand for any of the summer months (June - September) shall not be less than 85% of the highest recorded demand during the previous three summer months. In addition, the minimum billed demand for any of the winter months (October - May), shall not be less than 70% of the maximum recorded demand during any of the preceding summer months. For instance, if a building uses a peak of 120 Kw during one of the previous three summer months, the billed demand for the next summer month will be at least 102 Kw (85% of 120 Kw). Similarly, the billed demand for any following winter month would be 84 Kw (70% of 120 Kw). This remains true even if the recorded demand falls below 84 Kw. The Ratchet was created to maintain the expensive infrastructure needed to handle the summer peak demand. Because there is a substantial cost involved in maintaining generators, substations and transformers, utilities and public service commissions across the country have determined that the Ratchet is the fairest way to bill the customers who create seasonal power peaks.



LIPA also offers off-peak pricing rates for all commercial and industrial customers. For most customers, time-of-use rates are optional and can offer significant bill reductions if the customer is a relatively off-peak user or can shift load to off-peak periods.

For additional information on demand metering, call us at 1-800-490-0025. For information on Off-Peak Pricing, call the Infoline at 1-800-692-2626.

## Something to Pique Your Interest

Although you might not realize it, there are many service-oriented industries that have functional peaks and valleys. For instance:

- **Telecommunications** - Because most people use the phone during the daytime hours, phone companies offer lower calling rates in the late evening and on weekends.
- **Transportation** - Both railroads and airlines offer lower priced off-peak tickets following busy periods like rush hour or holidays.
- **Entertainment** - Because most people entertain in the evening, tickets to movies and plays are generally more affordable during afternoon matinee shows.