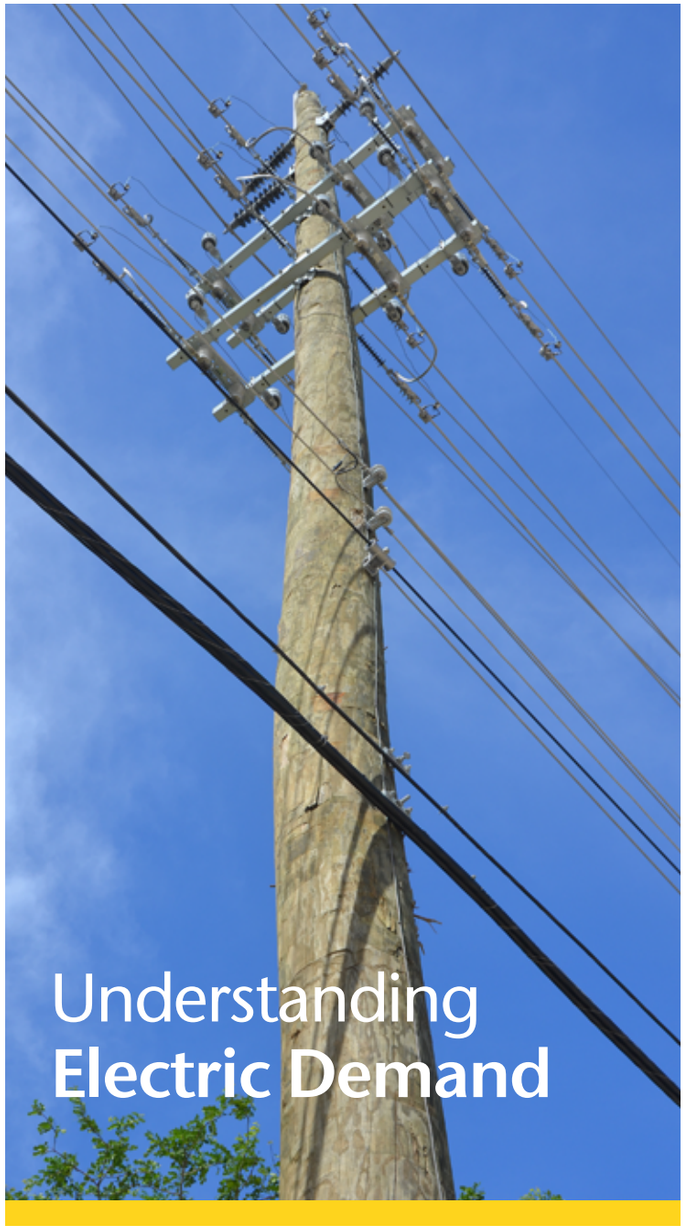


Understanding Electric Demand

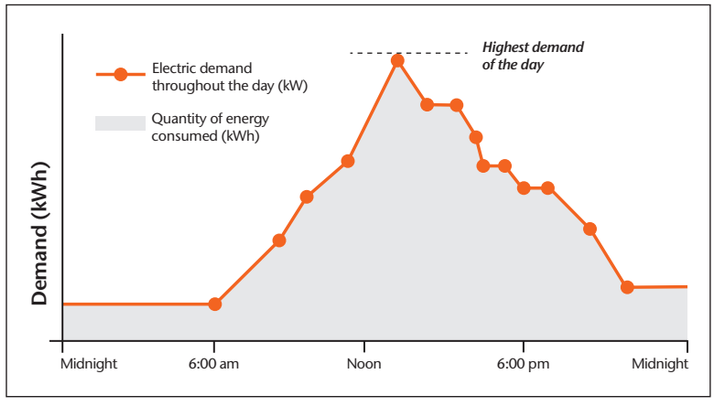
CUC
You've got the power

Our mission is to be a leader in the growth of our community by delivering safe, reliable energy services at competitive costs and with respect to the environment while being a model corporate citizen and providing a fair return to our shareholders. We are continuously looking at the way we perform with a view to improve the level of service we provide.

The following information is provided to assist customers in understanding our newest rate structure.

What are Demand Charges?

The existing line item on bills, the Energy Charge is the calculation of the amount of electricity kilowatt-hours (kWh) consumed during the billing period. Demand is the rate at which you consume electricity - or the amount needed to power your business at any given point in time. Your demand charges are based on the highest level of electricity supplied at one time during the billing period and at the time of day it is needed by your business. The diagram below illustrates this.



Consumption is measured in kWh and ***demand*** is measured in kilowatts (kW). You can imagine that power (kW) is like your speedometer (current speed), while energy (kWh) is like your odometer. The speedometer can quickly go from zero to sixty and back to zero, but the odometer only slowly counts up: faster if your speed is faster. The speedometer tells you how fast you are going right now (how much power or "***Demand***" you are using right now), while the odometer tells you how far you've gone (how much energy you've "***Consumed***" in total).

We at CUC must be ready to provide the exact amount of electricity you and every other customer needs, at any time, all the time. This electric "demand" varies by customer, by the time of day, and by the day of the year. It requires an electric system built like an eight-lane highway to handle peaks in demand that occur at varying times.

That electric system consists of 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 utilise separate charges for demand for large commercial customers.

Demand charges are not shown separately on bills for most residential and small commercial customers, but demand costs are built into their energy rates.

Demand Charges vs. Energy Charges

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 kW. Assume that the demand rate is $9.75 per kW, and the energy rate is $0.1183 per 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 0.25 hours) and would cost about $3.55 (30 kWh multiplied by $0.1183 per kWh). However, your demand charges are for 120 kW and would cost $1,170.00 (120 kW multiplied by $9.75 per kW). 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.

CUC has to invest the same amount of infrastructure for both examples below. This cost is fixed for CUC to meet this demand.

Example #1:

Electric Demand $1,170.00	Electric Consumption $3.55
120 kW x $9.75	30 kWh x 0.1183

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 $2,271.36. However, demand would remain at 120 kW and the cost at $1,170.00.

Example #2:

Electric Demand $1,170.00	Electric Consumption $2,271.36
120 kW x $9.75	19,200 kWh x 0.1183

Recording Demand

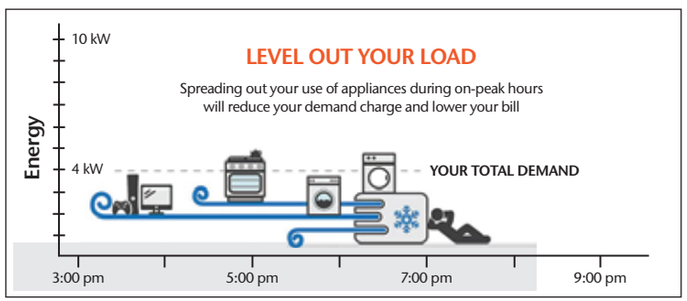
Demand is measured as the average load over a 15 minute period. If a building is using 120 kW for a 15 minute interval, the recorded demand would be 120 kW. If the building was using 120 kW for the first 10 minutes of an interval, and then completely shut down for the next five minutes of the interval,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

Although the electric meter installed at your premises measures demand over 15 minute intervals, it stores only the highest 15 minute period recorded during the day. This reading is used to compute demand charges on your electric bill (subject to a minimum demand charge explained later in this brochure under "Additional Capacity Charge").

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

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 $9.75 per month. In this case it amounts to $438.75 per month.



Controlling Demand

Because the demand meter only records ***coincidental*** demand, it is possible to reduce cooling (air-conditioning) demand by using several units to meet the buildings needs. If air-conditioning units are widely dispersed, they turn on and off at irregular intervals. This limits ***coincidental*** demand.

Building Energy Management Systems monitor and control services such as heating, ventilation and air-conditioning, ensuring the building operates at maximum levels of efficiency and removing wasted energy usage and associated costs.

Probably the best (and most affordable) way to control electric demand lies within the buildings 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.

Additional Capacity Charge

The demand charge rate at CUC is split between the Monthly Demand charge and the Additional Capacity Charge. The Additional Capacity Charge is the maximum recorded demand during any of the preceding twenty-four months. For instance, if a building uses a peak of 120 kW during one of the previous summer months, and the winter peak is 80 kW the additional Capacity Charge will be billed at 120 kW. The Monthly Demand Peak will be billed at 80 kW. Many utilities refer to this as Ratcheted Demand.

The Additional Capacity Charge was created to maintain the expensive infrastructure needed to handle the highest peak demand. Because there is a substantial cost involved in maintaining generators, substations and transformers, utilities and regulators across the world have determined that Ratcheting is the fairest way to bill the customers who create seasonal power peaks. This is even more relevant in the Cayman Islands where more and more of our customers are taking advantage of our sunny weather and implementing solar panels. Significant energy peaks are seen during maintenance periods when this equipment is taken off-line.

What Occurs after an Outage?

Following a power restoration event, the demand by a consumer will be artificially higher since electrical equipment and appliances will have a tendency to be active to compensate for the lack of electricity of the extended outage. For example, air-conditioning equipment will immediately come on to cool.

Likewise, refrigerators and freezers will run to bring their internal temperatures down. CUC has a 'forgiveness period' of 15 minutes programmed into the meters so that our customers are not penalized for their increased demand created by the outage. This may not be a concern for customers who utilise generators during outages.

CUC's Demand Rate Structure

Demand rates will be introduced to all Large Commercial customers in 2018. Large Commercial Customers without Distributed Energy Resources (DER) will have a phased in period of three years. During that time the energy charge will be reduced to a very low rate and the majority of cost recovery will occur through the demand rate and the additional charge rate.

Below is the demand rate structure.

	Large Commercial
Existing Rate	
Monthly Facilities Charge	$153.92
Energy Charge:	
First 30,000 kWh per month	0.1183
Over 30,000 kWh per month	0.0977

New Rates	
Monthly Facilities Charge	$153.92
Energy Charge (all kWh per month)	$0.00327
Monthly Billing Demand per kWh	$9.75
Additional Capacity Charge per kWh	$14.53

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*For further information on Demand Rates, please contact our Customer Service Team at **949-5200**, via e-mail at **service@cuc.ky** or visit our website at **www.cuc-cayman.com***