UNDERSTANDING YOUR DEMAND METER AND DELIVERY CHARGES

Body There are two main components to an electricity bill:

- Charges related to the **energy that is consumed**.
- Charges related to **delivering the energy to you, the customer**.

Being in Alberta, the customer has the option of who provides them with the energy they consume, which will then be delivered by the designated distribution company for their area.

FortisAlberta is the distribution company that delivers energy to more than 60% of Alberta's total electricity distribution network. Regardless of who supplies you with the energy you consume, it doesn't make sense to build competing sets of wires across our service territory, which would result in unnecessary and expensive duplication.

In all cases, the customer **receives only one bill**. The company supplying the customer with energy will send them a bill that includes both their energy and delivery charges.

Delivery charges

The delivery charge is the regulated cost of delivering electricity to consumers and is usually

- Distribution – the cost of building, operating, and maintaining the local distribution system.
- Transmission – the cost of building, operating, and maintaining the provincial power grid.

The purpose of this document is to explain what KWH and KVA of capacity mean and how they impact your delivery charges.

While KWH is a measure of energy, KVA is a measure of power.

A lot of people don't really understand the difference between energy and power. Here is how it works.

The KWH is a measure of **how much** energy is supplied by the electricity we use to run equipment over a specific period of time. The KVA is a unit of power that shows the **rate** at which energy is transmitted.

Another way of understanding the difference between KWH and KVA is with a "filling the bucket" analogy. Suppose someone wants to fill a 5-gallon bucket with water. They can use a

smaller hose connection to their sink providing 1 gallon per minute to do it, and it will take 5 minutes.

Alternatively, if this person needs the job to be done faster, they can get a larger faucet that provides 5 gallons per minute and fill the bucket in just one minute.

The **flow rate** is the equivalent to **demand**, and the **5 gallons of water** are equivalent to **consumption**. Filling both buckets has the same "consumption" but very different "demands."

The same is true for electricity. While one person may be able to accomplish the same thing by operating a small wattage appliance for many hours another person may be able to operate an appliance of higher wattage for just a few hours. The higher wattage piece of equipment will create a higher demand on the utility. Using our analogy, in a time sensitive situation, if a customer is asking for a larger pipe that costs more, it might be worth having the more expensive high flow rate or wattage. On the other hand, a customer whose demand is lesser will not require a high a flow rate or wattage. Therefore, utilities charge customers for both demand and consumption.

When building a new site, the distribution company ensures that adequate equipment is provided for reliable and continuous service. When someone requires a large supply of electricity, even for a short period of time, the system must be designed to accommodate this requirement. The electricity consumption and demand of farm customers for example, vary greatly. Some need large amounts of electricity occasionally—others, almost constantly. This is complicated by the the fact that electricity cannot be stored. It must be instantly delivered to each customer when needed. Meeting these customers' needs requires keeping a vast array of transformers, wires, substations, etc. The amount and size of this equipment must be large enough to meet peak consumption periods, i.e., when the need for electricity is highest.

Continuing with the example for farm customers, these customers with expected rate of energy usage that is relatively low i.e., below 10 KVA, have a meter that displays the consumption but not the demand. For these customers, a breaker size is used as a proxy for demand. While the breaker size concept is a quick and convenient way to calculate distribution charges, it is not the most accurate representation of the customer electricity usage.

For instance, one customer might have had a proxy demand of 7.5 KVA. Even though our records might indicate that this customer's actual demand exceeded 8 KVA, their distribution charges were based on a demand of 7.5kVA.

Since customers with demand needs of more than 10 KVA require a meter that displays both consumption and demand, these consumption meters will be replaced by more sophisticated demand meters.

A demand meter registers energy use over time in KWH and registers the rate of usage based on generally a 15-minute period (Demand Interval), storing the maximum value in a register.

Much like a car's odometer records accumulated mileage, the meter records consumption. It also functions as a speedometer to record demand with an important difference. A demand meter's needle advances as electricity consumption increases, just as the speedometer needle advances as the speed increases in a car. When the car stops, the needle moves back to zero, regardless of the highest kilometers per hour reached on the trip.

Unlike the speedometer needle, demand meters record the highest average demand reached and maintained in a 15-minute interval within the billing period. If the demand reaches 50 KVA, for example, and stays there for 15 minutes, the stored registered value remains at 50 KVA unless or until the demand exceeds that level. If the demand later reaches 55 KVA and stays there for 15 minutes, a new index point will be established even when the electricity usage is at a lower rate. The demand value will be reset back to 0 when the new billing period starts.

When going from a consumption meter to a demand meter, the billing demand tends to be the greater of the customer's highest metered demand in the billing period; 85% of the highest metered demand in the past 12 months ending with the billing period, or the Rate Minimum of 10 KVA (again, for the farm rate example).

If we use the example from above, let's discuss the following scenarios.

- In billing period 1 the customer's demand meter registered 55 KVA of capacity and no historical data was available. Their distribution charges will be for 55 KVA of capacity.
- In billing period 2 the customer's demand meter registered 40 KVA of capacity. 85% of the highest metered demand in the last 12 months including and ending with the billing period is 44 KVA (55*85%). The customer's distribution charges will be for 44 KVA. Even if they continue to show lower than 44 KVA demand for the next 11 months, their distribution charges will continue to be for 44 KVA of capacity.

In order to use electricity efficiently and to better manage one's delivery charges, it is important to consider the following:

1. Before a customer makes a purchase of power tools, equipment, or appliances, they should look at the power usage as indicated by the manufacturer. (the larger the wattage, the higher the demand and consumption).
2. Where possible, try not to have multiple pieces of equipment operating at the same time.
3. If possible, limit the duration of high demand to less than 15 minutes of usage. This will not set a new peak for the next 12 billing periods