Managing Electricity Use with *Interval Data*

Eliminating waste is part of business. The “My Usage” tool is available to all Colorado Springs Utilities customers at no charge. The tool allows each customer to view daily usage. The data can be helpful by comparing one day to another, one week to another, this time last year, etc. The data can provide insight to the relationship between operational decisions and utility bills. Daily reads are visible for electric, natural gas, and water.

“Interval data” is available on many electric meters. The term ‘interval data’ means meter reading intervals less than a day apart. The intervals of time in recorded interval data is sometimes hourly, sometimes 15 minutes, and sometimes 5 minutes, depending on the meter. But any of the intervals give excellent insight into usage you might not be aware of. Information is power!

Even the most basic electric meter can display interval data showing kWh – this is actually a perfect fit when the bill is based almost entirely on kWh. Kilowatt-hours, or “kWh” is a unit of electric energy. For small commercial bills, reducing kWh will reduce your bill directly. Watching “kWh” use is like watching dollar bills on a cash register. In rough numbers, about every ten of them is a dollar, give or take. But try to remember that electricity use is a tool for business and industry. Energy is a good thing, just not one to waste, so you’ll see some example of electricity use when the business is closed for the night…..at this point the electricity use is a cost without an associated benefit.

Interval data gives you new information that you can use to control your electricity use and cost, and you can know in advance of the bill. All buildings seem to use “some” amount of electricity at night, but it can be more than you think. But it starts by asking questions that couldn’t be asked before having interval data:

“Hey, what is that usage I’m seeing in the middle of the night?”
“I thought that was supposed to be off on the weekends!”
“Why doesn’t usage go down when we go home?” Etc.

Tell me what it is?
When studying interval data, questions pop up about ‘what is that’ which is exactly why we suggest you look at this data. The utility does not offer the service to find for you where your electricity is going after it goes through the meter, but with a little scouting you can probably figure it out on your own. For example you may be able to turn something off for an hour and see the results on MyUsage the next day. If you use interval data to find ‘ghost loads’ you can learn a lot and control a portion of your bill. What you’re looking for are things that are using electricity needlessly, like lights, HVAC, space heaters, computers, etc. It all adds up.

*Safety note: Of course, some things need to be left on for safety or security or to protect something from freezing, keep food cold, maintain computer data, etc……so don’t turn off critical things. And please, always be careful with electricity and don’t open up electrical panels or get near wiring unless you are a qualified electrician. Just don’t. Don’t do anything you are not comfortable doing or turn things off without knowing what they are for. Stick to basics and stay safe.*
Please visit the customer website [www.csu.org](http://www.csu.org) and in the “My Account” section, click on “My Usage”. You will need to create a user name and password if you haven't already done so for “My Account”. Once inside MyUsage, pick the meter you are interested.

Customers can use pre-made graphs or download raw data. The raw data is in Excel format if you want to use it.

If you have a basic ‘kWh’ meter, you just pick the date range and ‘display graph’. If you have a ‘demand meter’, you will see other options besides kWh.

Interval graphs are available for 7 days or less. Interval spreadsheets are available for 45 days or less.
Daily Data

For date ranges 8 days or more you will automatically see daily data. For date ranges 7 days or less you will automatically see interval data.

Side note for daily data display.

Meters all have a ‘multiplier’ that records daily usage as

kWh x 1 or kWh x 10 or kWh x 100

Most of the small commercial meters will have a multiplier of “1” and look like the top chart.

If your meter has a multiplier that is not 1, the daily data will lose some of the ‘smoothness’ as shown in the middle chart (x10) and bottom chart (x100).
The Case for Interval Data:
Same place, same day. More data can be useful.

Patterns, Patterns:
We hope the data helps you.
Examples of how interval data can help you control your electric bill. These are limited to the basic ‘kWh’ meters. What each your personal charts ‘mean’ is up to you to figure out, but we think a couple examples will get you on the trail. The visual presentment of raw data helps a lot.

A note on interval data: it’s very helpful, but not perfect. The readings on a monthly basis are very reliable. The more frequent readings (daily and interval) can have variance – say a truck parks right next to the meter and blocks the signal.....there may be a couple days where the interval or daily data shows “zero” and then all of a sudden the truck is moved and a “catch up reading” occurs; the zeros look like something wrong and the accumulation of usage all at once looks like something is wrong, while neither of them is wrong. So, if you examine each individual reading you may see an occasional anomaly. These can be smoothed out using the raw data in a spreadsheet if you want; on the pre-made charts they will show up. But the occasional bump in data aside, the interval data is your friend for seeing usage associated with times of day, equipment operation, and outside of business hours.

Electricity Usage from 2/6/2017 to 2/12/2017

Clues from Interval Data:

Saturday and Sunday usage looks almost identical to weekday use. If the facility is closed on weekends, this usage may not be needed.

Difference between day and night usage is very small, not sure why
Clues from Interval Data:

Day/night difference is strong — most things are being turned off. Yay!

Weekend electric use is not turning down...it’s actually a bit higher. Odd, since the facility is closed at that time.

Let’s drill down and look at a single day of the week (bottom chart)

Clues from Interval Data:

We can see there is a ghost load that probably goes on every night as a minimum usage. What it is we don’t know for sure, but it doesn’t seem high.

This is a weekday. The abrupt changes are probably the programmable thermostat. ‘Occupied’ starts about 6am and ends about 11pm.

11pm? Is that what is intended if the facility closes at 6pm? Hmm... Maybe somebody worked late that day. We could compare other days to look for a pattern.
Clues from Interval Data:

Ghost load buster.
There is a pretty clear pattern of about “3” on the chart. Is that a lot? Is it a big machine?

Hard to say ‘what’ it is, but we can estimate its size.

kWh=kW*hours.
This is a 15 minute interval which is 0.25 hours (a fourth of an hour)

…and so… the ghost load kW =
=3 kWh/0.25 hours = 12 kW

A good place to start is counting the outside lights, in kW (1 kW = watts / 1000).

If there is more kW at night than explained by the parking lot lighting, the difference is the ghost load.

A data closet, a few emergency lights are normal. A bunch of desk computers left on or space heaters left on, or HVAC cranking away becomes something to “discuss”.

A very steady use that isn’t lights could be a motor left running (or needing to run). A rough approximation of motor size is 1 kW = 1 Hp.