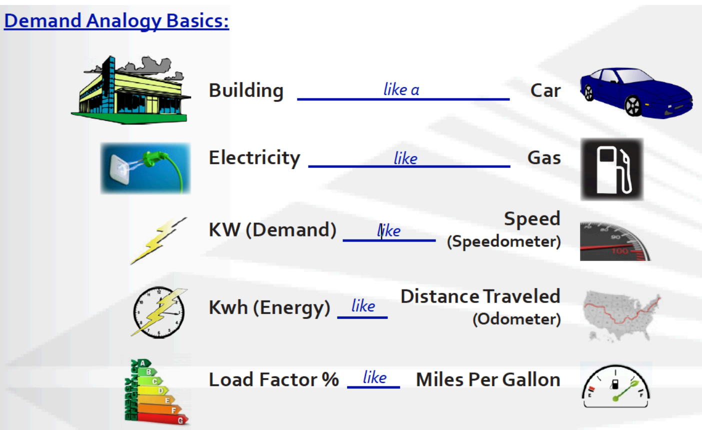
THE NEWSBOY
News for Members of San Luis Valley Rural Electric Cooperative

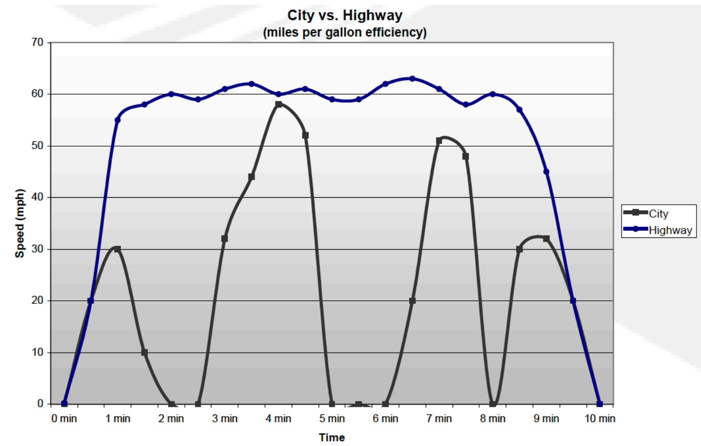
What Is Demand?

It may seem like a pretty simple question, but the answer is far from simple for those who aren't in the electric utility industry. Whether you're still trying to nail down the basics, or just trying to explain the basics, this document will hopefully help you achieve the simple answer to that not-so-simple question.

The trick for explaining demand all rests in analogy. We've found the easiest way to make demand relatable is through comparing it to a car.



This graph depicts the typical speeds of driving in the city versus on thehighway for 10 minutes. As you can see, once you reach the desired speed on the highway (blue line) your speed stays fairly consistent. The peaks and valleys of city driving (gray line) are caused by the "stop and go" of traffic lights and stop signs which decreases your fuel efficiency.



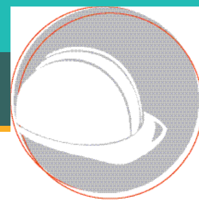
(continued on page 2)

You may have noticed the difference in fuel efficiency (mpg) when you drive on the highway versus in the city. Your car's miles per gallon increase when driving on the highway. This occurs because you are driving at a consistent speed and you are taking advantage of momentum. There are no stop signs or traffic lights, so your use of energy (gas) is at a fairly stable rate. When driving in the city, your vehicle is frequently accelerating and decelerating, making it difficult to take advantage of momentum. Many people try to improve the efficiency of city driving by slowly accelerating when a light turns green instead of pushing the pedal to the metal. This saves some small amount of fuel but doesn't drastically improve mileage like highway driving at a constant speed.

THIS ISSUE

JUNE 2019 | VOLUME 46 | ISSUE 6

What Is Demand? *(continued from page 1)*



The same can be said of your building's energy use. The more extreme your peaks and valleys you are, the less efficient your use of electricity is. Although this graph may not replicate what your energy use looks like, it's easier to grasp the concept of inefficiency through this analogy.

> "The objective is to utilize momentum to improve efficiency."

Demand Control
We are in the business of helping those suffering from high demand charges by teaching them how to "highway drive" when it comes to their building's electric use. Demand control isn't about controlling the amount of electricity (gas) consumed, but instead how efficiently it's consumed (mpg). The issue most people face in high electric costs is "pushing the pedal to metal" when it comes to their electric use. They are unaware that they are "city driving" vs. "highway driving" with their building.

Demand is defined as the rate of electric use. In our car analogy, demand is the speed at which your building is using electricity. Utility companies bill your electric use based on a combination of the amount of energy consumed (kWh/gas) and the highest rate at which it was consumed (kW/ speed). Demand is measured in kilowatts (kW), and most utilities bill for the peak demand, which is the highest demand interval (usually 15 minutes) during the billing month.

So how can you "highway drive" with your building?
Keep your demand (speed) steady! You can manually control your large non-critical electric loads, or you can have an Energy Sentry do it for you automatically. An Energy Sentry demand management system is kind of like cruise control for your building's electric use. Your larger controllable loads, such as air conditioning, are automatically cycled on and off on a priority basis that you determine. This keeps you below a certain kW threshold, and ensures that your energy use remains at stable levels leaving you with fewer peaks and valleys and lower electric bills!

Sourced from www.energysentry.com

LOREN HOWARD

How Does Peak Demand Occur?

There is a common misunderstanding out there about how peak demand occurs and is really measured. Well we're here to set the record straight!

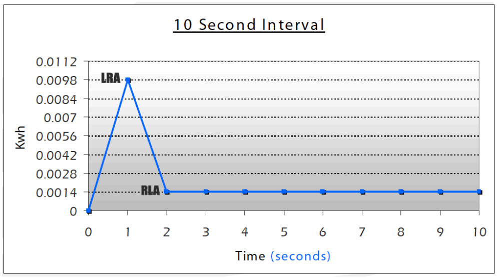
Many times, we've heard "The instant I turn on my air conditioner, (or other large electric load), that instantaneous start-up spike sets my peak." Although that's commonly thought of as the peak demand… it's not, and here's why:

When switched on, inductive machines (machines with motors) will initially use a large amount of energy to begin turning the motor that is used to power the machine. The initial current draw of the motor is called the Locked Rotor Amps (LRA). Once the motor gains momentum it drops down to a steady pace referred to as the Run Load Amps (RLA) or the static load size. The LRA is what is commonly thought of as "setting the peak" as mentioned in the statement above. In actuality, the LRA occurs for such a short period of time it has very little energy content, and thus, very little effect on the peak demand.

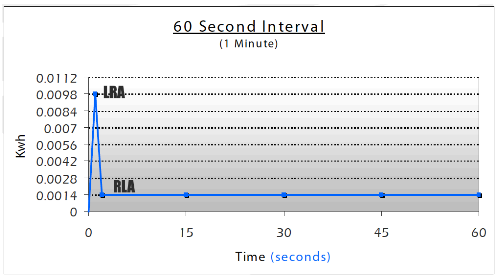
Air Conditioner Example:
To better understand this concept, let's look at an example of a single-phase 240 Volt 21 AMP Air Conditioner that has a LRA of .0098 kwh/s and a RLA of .0014 kwh/s. **the LRA is normally 7 times the amount of the RLA*

This graph shows the first 10 seconds of the air conditioner's electric use in kWhs.

In the first second of use, there is an initial spike where the current energizes the motor windings and tries to begin turning the motor in the air conditioner (LRA). As the motor gains momentum, energy needed decreases and drops down to the RLA.



If we were to look at the first 60 seconds of use it would look like the graph below.



The amount of energy use is staying constant at the static load size (RLA). At this point the air conditioner will remain at the RLA of .0014 kWh/s unless it is turned off.

Refresher on Peak Demand
To recap, most commercial customers and some residential customers (depending on the utility) are billed something called a "demand charge". The demand charge is

PUBLISHER'S STATEMENT

The Newsboy (publication #551-450) is an official publication of the San Luis Valley Rural Electric Cooperative, Inc.; 3625 US Hwy 160 W, Monte Vista, CO 81144. The Newsboy is published monthly for SLVREC members. Periodical postage paid at Monte Vista, CO 81144.

Postmaster, send Form 3579 to NEWSBOY, P.O. Box 3625, Monte Vista, CO 81144-3625.

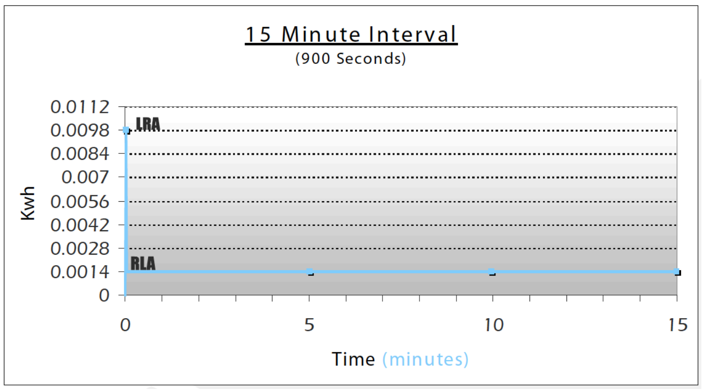
How Does Demand Occur? *(continued from page 3)*

the amount you pay, per kW, during the billing month for the "peak demand." The peak demand is the highest kWh usage in any demand interval (usually 15 minutes) during the billing month. It determines not only your demand charge, but may also determine what rate you're placed on by the utility. The utility's meter records and averages your kWh use for each of those 15-minute intervals, and the interval with the highest 15-minute usage (in that billing period) sets your peak demand for that month.

The 15-Minute Interval

To reiterate, the peak demand is not the highest instantaneous kW spike that occurs during the billing month, it is the highest **averaged** 15-minute period that occurs within the billing month.

So if we go back to our example of the air conditioner, and look at its use in a 15-minute period it would look like the graph below:

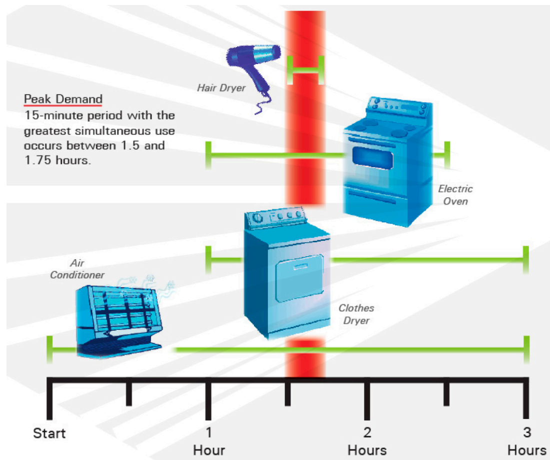


The one second energy spike of .0098 kWh, has very little effect on the 15-minute interval average when the remaining 899 seconds are at .0014 kWh. It is very unlikely that one air conditioner will be the only electric load in operation. However, the concept of how little the turn-on spike effects the Peak Demand is shown. Basically, that spike is averaged out as somewhat of a "glitch" because it happens for such a brief period of time. If you were to calculate demand in a 15-minute interval at a constant rate of .0014 it would average out at 5.04 kW. When adding the brief one second spike, the demand only increases to about 5.07 kW. This is a very minuscule difference when you consider most situations have several electric loads impacting the demand at much larger scales.

Spotting the Peak

When studying peak demand it is essential to take into consideration all the electric loads in operation and when they are operating. The example below displays a 3-hour timeline of three larger electric loads and one smaller load in use at various times. As mentioned above, Peak Demand occurs in the highest averaged 15-minute period.

In this case it would most likely occur between 1.5 and 1.75 hours when all the loads are being used as the same time. **Take note that this is not when the larger loads are being turned on (when turn-on spikes occur)*



Takeaway

- The initial spike in energy use caused by turning on a machine (LRA) lasts for a very brief period, typically a few seconds. Energy use then drops to the static load size (RLA).
- The turn-on spike has very little effect on the total amount of energy use calculated in the 15-minute interval because it occurs for such a brief period of time.
- Peak demand is determined by the highest kWh usage in any 15-minute demand interval within a billing month.
- The real "peak demand" is a result of having a 15-minute interval where there were coincidental maximum number of loads operating simultaneously. ("Too many loads on together for too long")
- There are approximately 3,000 15-minute intervals in a typical billing period, in other words 3,000 opportunities to set your peak demand. (Most utilities use 15-minute intervals, some use 30 or 60-minute intervals.)
- When studying peak demand it is essential to take into consideration all the electric loads in operation and when they are operating.

Sourced from www.energysentry.com

Better Together!

What makes a co-op a co-op? Our members! At San Luis Valley REC, we love partnering with the community and Tri-State G&T to bring safety education and career information to our local schools!

In the past few months, we have attended three different school events to help educate a wide range of students on the importance of electrical safety. At Farm Safety Day, we partnered with Monte Vista Coop and Tri-State to share the Story Behind the Switch and to share safety tips with young students from schools across the San Luis Valley.

Tri-State G&T provides a wonderful interactive presentation to teach youth about where electricity comes from and how it gets to them. We coupled that with that the tried and true REC presentation by Jeff Henderhan and Shan Hunter on the importance of staying safe around electric line and equipment.

Mountain Valley Schools gave us the opportunity to visit with their students about the different career paths available inside the co-op world. Kurt Taffin, Terry Daley, Michelle Trujillo, and Andrea Oaks-Jaramillo represented some of the diverse positions available within a modern cooperative. Kurt always makes a great connection with the students and may have even talked a few into the career path of a lineworker!

Alamosa Elementary K-2 was by far the cutest career day. Ben Osburn and Jed Larsen awed these little ones with lineman gear and tales of how to safe around electricity. The kids had a great time trying on lineman gear and listened intently to Ben and Jed's safety tips. We are always grateful to be invited to participate in such important community events! Please call our office if you would like to schedule a safety demonstration for your school or organization: 719-852-3538.

SAN LUIS VALLEY REC

POWERING A VITAL VALLEY

Periodical Postage
Paid at Monte Vista, CO

P.O. Box 3625
Monte Vista, CO 81144

June 2019

POWERING OUR COMMUNITY

SLVREC's office is open from 7 a.m. to 5 p.m.
Monday through Thursday.
The office is closed Friday through Sunday.

ENERGY ASSISTANCE
866-HEAT HELP (866-432-8435)
www.energyoutreach.org

Your Touchstone Energy® Cooperative

SCHEDULED MEETINGS
Board Meeting: June 25, 2019 @ 9:30 a.m.
The REC Board of Directors meets the last Tuesday of each month unless otherwise stated. Members are welcome.