Viewing energy as an ingredient in your product or service, energy use that does not produce business value is a drain on profit. Interval data will let you 'see' the standby use. If you decide it is too much and want to reduce it, we'll give you some ideas to get started.
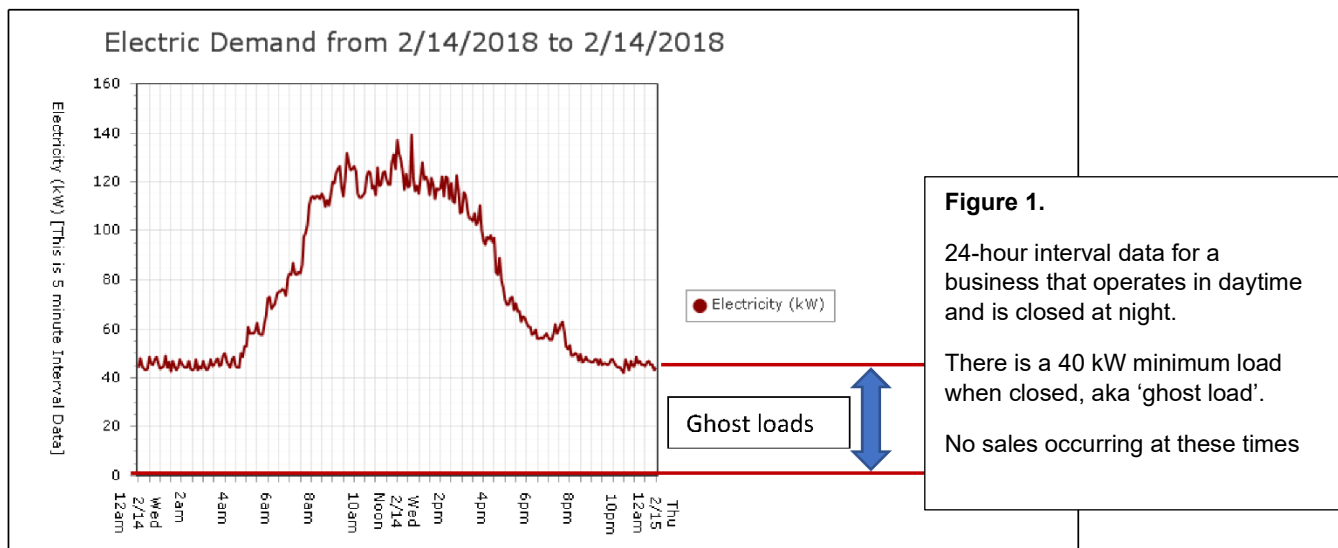
Energy can be very useful. In business, it helps get things done; a tool for producing your product or service which you are selling.

For a moment, separate the discussions of efficiency, demand costs, and other utility considerations, and step back to basics. With the facility closed, producing no product or service…in times when the business is not earning money, expenses should be minimized where possible. Expenses that do not need to be there are paid for by eroded profits. Nobody wants that.

So, the discussions about efficiency, fuel switching, demand charges are all good. *This article points to energy use associated with things left running needlessly.* Obviously, turning those things off makes sense. Sometimes they are hard to spot.

The use of 'interval data' (hourly, 15-minute, or even 5-minute data) makes the invisible visible. See **Figure 1**.

Electric Demand from 2/14/2018 to 2/14/2018

● Electricity (kW)

Ghost loads

Figure 1.

24-hour interval data for a business that operates in daytime and is closed at night.

There is a 40 kW minimum load when closed, aka 'ghost load'.

No sales occurring at these times

All buildings have some electric use when closed. Emergency lights, parking lot lights, some computers in sleep mode, vending machine, security system powered up. The question is whether some of this usage and cost does *not* need to be there.

Ghost load reductions require some investigative work for you.

Step 1

Begin by looking at multiple charts (charts are made automatically when you enter a date range). **Figure 1** is for one day and works well – you may be able to see what you need with multiple days or a week. The ghost loads may look different in winter vs. summer.

> Note: not all are 'flat' like **Figure 1** – you may see blips in the middle of the night if something large starts and stops (you can ask if *that* usage is necessary as well).

Step 2

The step is to decide if the overnight load and business cost is justified or not. Quickest thing to tally up is the exterior lights and whatever emergency lights are on inside. Watts / 1000 = kW.   Let's say you find 7 kW of lights – then there are 33 kW as-yet unaccounted for. And you look around for more.

From experience, you won't account for 'all' of the loads. Some things like refrigerators 'cycle' vs. always on. This can become a science project, but with a few reasonable values (see **Table 1** at the end), you can *get to a point that says most of what you see makes sense…. or doesn't*.

The 'or doesn't category is what you are after.   The value of unexplained ghost load gives you some idea of what to look for, although it may be a collection of little things and not one big thing. In rough numbers, here are some things we have found doing this:

- Thermostat fan switch set to 'on' meaning 'on forever'
- Warehouse lights left on
- Lights left on Friday night for the cleaning crew who didn't actually come until Sunday evening
- Automatic control setting error kept 25 small fan motors running (lots of little fans = 1 big fan)
- Timer failure kept air handler fan from ever turning off
- 35 computers left on vs. sleep mode
- Air compressor left running
- Unused data equipment left idling in the racks
- Cooling tower basin heater running because the tower was not drained for winter

Step 3

Once you get to where you feel the ghost load value is reasonable for your business, make note of the value. From this point, your work will get easier. Periodically, once a month or quarter, or after some change in the building, re-visit the customer portal and grab some more interval charts. If the ghost loads are about the same, you can watch some TV.   If they begin to creep back to their old habits, you'll know to intervene again.

Some facilities have very low ghost loads, such as 10-20% of daytime usage which is very lean. 30-40% is more common and can usually be improved, and some see 50-60% when the facility is closed!

Hunting for ghost loads can be frustrating especially when it is at night when everyone else is home watching TV. For your motivation, remind yourself that each dollar spent without business return for it comes out of profit. Frugal is good. Savings are yours. And, please be safe around equipment using electricity.

Table 1. Some typical values for ghost load hunting

kW=(watts / 1000) * cycling multiplier

	watts each	Cycling multiplier	Remarks
Lighting, per lamp	Too many to list. Watts = lamp qty * Watts each * ballast factor	1	Find spare bulbs, or ask. Typical ballast factors 1.0 Incandescent 1.2 metal halide and high pressure sodium 1.2 T-12 fluorescent 0.88 T-8 fluorescent 1.0 LED
Indoor emergency lighting, fluorescent / LED	0.05W / 0.035W per SF, give or take	1	
Plug loads, office average (not including copiers or computers, just the misc. items here and there)	0.2W per SF, give or take	1	
Computer, on desktop / laptop, spinning drives. SSD drives less.	60W / 30W active Power use negligible in sleep mode	1	
Flat monitor, 24 inch, on or screen saver (same)	25W	1	
Motors < 1 Hp, running steady	1000W per Hp	1	
Motors >=1 Hp, running steady	665W per Hp	1	
Rooftop unit or condensing unit with cooling compressor, unit off, load is the 'crankcase heater'	10W per ton of cooling unit rating	1	Do not turn these off, they are very much needed to protect the compressors
Refrigeration Residential standard or restaurant reach-in Walk in cooler, std box size Walk in freezer, std box size	 250W 500W 750W	 0.5 0.5 0.5	0.7 during occupied hours, but less at night since doors are kept closed.
Space heater, glowing orange, standard size (not mini)	1500W	1	
Copy machine, idle / sleep mode	300W / 150W	1	
Television, flat screen 40 inch, running	200W	1	Power 'off' is part of plug loads
Fire alarm / security panel	50W each	1	Rough guess