



Everyday Environmental Stewardship

Monitoring Utility Use and Cost

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Key Issue

Monitoring Utility Use and Cost

Stewardship Opportunity

Knowing Use and Cost
Reducing and Conserving Energy

Monitoring utility use and cost – for either your home or your House Of Worship (HOW) --is an important first step toward conserving energy, reducing your carbon footprint and saving money! Monitoring utility use tells exactly how much is consumed which in turn helps identify which energy usage areas can be reduced. Looking at heating and cooling costs in relation to degree days shows if the building heating or cooling use pattern matches actual need, per the weather.

Over all, monitoring energy use and cost helps to pin-point the time and reasons for the building's energy use, thus providing the information on which to act to help make good energy use decisions. This is also a great way to both prepare for an energy audit. Having the auditor look at high energy use areas will make the audit more effective.

Remember, *Stewardship is what we do*. **Cost** is the **consequence** of what we do. And with energy, cost is more than \$; it is also the contribution to climate change that we make when we use energy. The extreme weather that climate change causes impacts people around the world and will impact future generations, so we need to do what we can to reduce our energy use.

A good and easy way to monitor is to use MIP&L's *Utility Use & Cost* spreadsheet for electricity, oil, gas, propane and water.

Stewardship Opportunity #1 — Knowing Utility Use and Cost

Knowing a home's or HOW's utility use and cost is easy. Because seasons vary year to year, it is important to get three years of utility use data so you can identify trends. Fortunately, you can call your electric or gas company's customer service number, give them your account number and the company will send the history to you. If your utility company does not offer a history, then creating long term tables from monthly bills is the only alternative. (Some bills have your last 12 month's usage in them for reference). Your community's Public Works Department will be very happy to send you your water usage history. Take this information and enter it into the appropriate MIP&L spreadsheet for that utility.

www.mipandl.org/euehome.html

The spreadsheet for electricity looks like this, before data entry:

ELECTRICITY USE								
Year	Bill Month	\$s	% of prior year \$s	kWh	\$/kWh	% of prior year kWh	Cooling Degree Days	% of prior year DD
2014	January		#DIV/0!		#DIV/0!	#DIV/0!	0	
	February		#DIV/0!		#DIV/0!	#DIV/0!	0	
	March		#DIV/0!		#DIV/0!	#DIV/0!	0	
	April		#DIV/0!		#DIV/0!	#DIV/0!	0	0.00%
	May		#DIV/0!		#DIV/0!	#DIV/0!	0	0.00%
	June		#DIV/0!		#DIV/0!	#DIV/0!	0	0.00%
	July		#DIV/0!		#DIV/0!	#DIV/0!	0	0.00%
	August		#DIV/0!		#DIV/0!	#DIV/0!	0	0.00%
	September		#DIV/0!		#DIV/0!	#DIV/0!	0	0.00%
	October		#DIV/0!		#DIV/0!	#DIV/0!	0	0.00%
	November		#DIV/0!		#DIV/0!	#DIV/0!	0	0.00%
	December		#DIV/0!		#DIV/0!	#DIV/0!	0	0.00%
		\$0.00	#DIV/0!	0	#DIV/0!	#DIV/0!	0	#DIV/0!

The spreadsheet contains separate sheets for each type of energy you may use and for water.

For each type of energy you use, put in the amount paid and the amount used at the **green blocks**. Everything else calculates for you.

If the history from the utility companies only give you the billing amount per month, then use the equation below to determine use.

$$\text{\$s in the month} / \text{\$/ per therm or kWh} = \text{Therms or kWhs Used}$$

Interpreting the results

Once all the data are entered, focus on the energy use, not cost, so you can begin to see long-term trends and patterns. If electricity use is consistently high during the darker winter months (due to lighting) and the hottest part of the summer (due to central cooling), then electrical costs may be addressed. If heating costs are high during the winter, then the house may need to be further insulated, or the heating system upgraded, or the thermostat changed, or new zones added, or windows upgraded, or a combination of all these! If the water your usage spikes in a particular month but you can't explain it,

then there may be a pipeline leak. These long term tables are the way to way to prompt you to do this. The next page has a sample of a completed sheet for electricity.

Example of Utility Use and Cost: Electricity

Year	Bill Month	\$s	% of prior year \$s	kWh	\$/kWh	% of prior year kWh	Cooling Degree Days	% of prior year DD
2011	January	\$1,559.36	173.35%	1,044	\$1.49	173.35%	998	106.62%
	February	\$845.46	49.93%	1,186	\$0.71	49.93%	819	110.08%
	March	\$1,595.62	117.34%	949	\$1.68	117.34%	646	130.77%
	April	\$1,275.62	117.26%	645	\$1.98	117.26%	312	143.78%
	May	\$872.83	134.32%	331	\$2.64	134.32%	116	178.46%
	June	\$442.15	85.60%	138	\$3.20	85.60%	15	375.00%
	July	\$173.38	190.78%	37	\$4.69	154.17%	0	#DIV/0!
	August	\$76.37	93.98%	3	\$25.46	150.00%	0	
	September	\$120.56	237.70%	18	\$6.70	90.00%	12	
	October	\$155.41	195.85%	132	\$1.18	162.96%	153	91.07%
	November	\$510.45	441.18%	432	\$1.18	91.14%	315	70.47%
	December	\$781.82	140.55%	606	\$1.29	81.67%	622	74.22%
		\$8,409.03	117.10%	5,521	\$1.52	90.70%	4,008	102.43%
2012	January	\$1,157.84	74.25%	909	\$1.27	87.07%	810	81.16%
	February	\$1,119.87	132.46%	896	\$1.25	75.55%	659	80.46%
	March	\$1,003.24	62.87%	838	\$1.20	88.30%	455	70.43%
	April	\$547.32	42.91%	449	\$1.22	69.61%	254	81.41%
	May	\$275.84	31.60%	249	\$1.11	75.23%	83	71.55%
	June	\$98.76	22.34%	80	\$1.23	57.97%	20	133.33%
	July	\$48.69	28.08%	13	\$3.75	35.14%	0	#DIV/0!
	August	\$41.47	54.30%	3	\$13.82	100.00%	0	#DIV/0!
	September	\$45.70	37.91%	3	\$15.23	16.67%	19	158.33%
	October	\$160.66	103.38%	131	\$1.23	99.24%	137	89.54%
	November	\$647.57	126.86%	435	\$1.49	100.69%	527	167.30%
	December	\$777.28	99.42%	775	\$1.00	127.89%	662	106.43%
		\$5,924.24	70.45%	4,781	\$1.24	86.60%	3,626	90.47%

Degree Days

Temperatures vary from year to year – some winters are colder than others and some summers are hotter. Comparing changes in energy use with changes in the number of degree days will show if energy use changes are weather related: If one winter has 10% more heating degree days than the prior year, you should expect to use 10% more fuel. After you take an action to reduce energy consumption and you use 10% less energy even though there are 10% more degree days, you know you have saved 20% over what you would have without the change. The spreadsheet has historical degree data in it already. There is a link and instructions on the Degree Days sheet so you can update them.

Pulling it all together

The UtilSum spreadsheet links to all the other sheets and pulls summary data into one convenient place. You can see how much you spend on all energy sources combined. Many people have never done this and are surprised to see the total.

This sheet gives you one other important measurement of the impact of your energy use: carbon footprint. All fossil fuels – heating oil, natural gas, and the coal often used to generate electricity – emit carbon dioxide into the atmosphere when they are burned. This contributes to climate change. So in addition to looking where you spend the most money on energy, you should also look at what is the greatest source of carbon emissions and invest in ways to reduce your carbon footprint. For example, if you heat with oil, that is likely to be the largest part of your carbon footprint. Better insulation or upgrading your furnace or boiler to a more efficient one can dramatically cut your carbon emissions.

Getting a Home Energy Audit

Now that you know how much you spend on energy and what types of energy you use most, a home energy audit will give you specifics about which areas of your energy use can be reduced, which appliances can be replaced, etc.. Most utilities offer these audits free of cost. They take roughly 1 1/2 hours and are a HUGE benefit to you. Call your electric or gas company's customer service line or go to <http://www.masssave.com/> to find out more.

For more information on home energy audits, get MIP&L's Everyday Environmental Stewardship report for *Home Energy Audits* at

<http://www.mipandl.org/everyday.htm>

Updated by Jim Nail, February 2014