



Monitoring Utility Use and Cost

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Key Issue

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Stewardship Opportunity

Knowing Use and Cost Reducing and Conserving Energy

Monitoring utility use and cost can conserve energy, reduce your carbon footprint and save money! A good and easy way to monitor is to use MIP&L's spreadsheet tables for electricity, oil, gas, and water use and cost. These track long term changes in utility use and cost.

Monitoring utility use tells exactly how much is consumed which in turn helps identify which utility 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. This is also a great way to both prepare for a home energy audit. Having the auditor look at high-energy use areas will make the audit more effective.

Over all, monitoring home energy use and cost helps to pinpoint 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. 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 impact on the planet and all who live thereon, today and into the future.

Stewardship Opportunity #1 — Knowing Utility Use and Cost

Knowing a home's utility use and cost is easy. In order to track long term utility usage, gas and electric companies have usage history for each account. Call the utility company through customer service with your account number and request the billing history. The company will send the history to you. Different utility companies have different lengths of history. For example, NationalGrid has electric history for 16 months but no gas history available while Keyspan has a three-year history for natural gas.

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 mail or fax you your water usage history. Take this information and put it into a MIP&L spreadsheet, available for download from our website:

www.mipandl.org/resources/MIPL_HOWUtiUseCost.xls.

| Year | Bill Date | \$s | % increase \$s | Therms | \$/thrm | % increase therms | Heating Degree Days | % increase Degree Days |
|------|-----------|-----|-------------------|--------|---------|----------------------|------------------------|------------------------------|
| 2004 | January | | % | | \$ | % | 1,059 | % |

Put in the amount paid and the amount used at the green blocks. Everything calculates for you.

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

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

Long-Term Tables

Creating tables of these utility histories shows 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 heat generation system upgraded, or the thermostat changed, or new zones added, or windows upgraded, or a combination of all these! If the water bill doubles in a month but your usage has not, then there may be a pipeline leak. There is no possible way to identify what parts of the house need to be repaired or replaced without knowing how much energy each appliance or piece of equipment consumes. These long-term tables are the way to way to prompt you to do this. The next page has a sample of a long-term table.

Real-Time Monitoring

Another effective way to monitor electrical use is to buy and install “real-time” monitors. The most sensible is an electricity monitor. There are two types of electricity monitors:

(1) those that plug into individual devices and show that particular device’s electrical use; and (2) those that plug into the meter and show the entire house’s electrical use. Both are effective.

These monitors come with many different options, but a good one is the Power Cost Monitor. Try <http://www.save-electricity.ca/powercost-monitor.html>. Tests involving such monitors have proven to reduce electricity use by 20%. By knowing which devices consume the most electricity helps avoid leaving them on and not using them. For example, central cooling uses a lot of electricity. Leaving central cooling on while running errands all day wastes energy and raises electrical bills.

Example of MIP&L Utility Use and Cost Spreadsheet for Electricity

| Year | Bill Month | \$s | % increase \$s | KWH | S/KWH | % increase KWH | Cooling Degree Days | % increase DD |
|------|------------|------------|----------------|-------|---------|----------------|---------------------|---------------|
| 2008 | January | \$113.04 | 93.42% | 594 | \$0.190 | 95.19% | 1 | |
| | February | \$140.70 | 102.31% | 715 | \$0.197 | 105.93% | 0 | |
| | March | \$129.94 | 95.84% | 657 | \$0.198 | 97.62% | 0 | |
| | April | \$130.14 | 110.48% | 658 | \$0.198 | 109.85% | 32 | 100.00% |
| | May | \$124.19 | 94.82% | 626 | \$0.198 | 93.29% | 134 | 56.54% |
| | June | \$116.97 | 96.55% | 575 | \$0.203 | 95.99% | 468 | 114.43% |
| | July | \$150.79 | 73.99% | 659 | \$0.229 | 70.56% | 628 | 111.55% |
| | August | \$190.03 | 89.81% | 802 | \$0.237 | 80.12% | 475 | 85.59% |
| | September | \$169.50 | 96.30% | 708 | \$0.239 | 85.71% | 338 | 87.79% |
| | October | \$228.88 | 112.89% | 981 | \$0.233 | 100.51% | 66 | 39.52% |
| | November | \$159.08 | 113.69% | 755 | \$0.211 | 100.40% | 3 | 75.00% |
| | December | \$140.54 | 112.41% | 667 | \$0.211 | 100.00% | 0 | |
| | TOTAL | \$1,793.80 | 98.39% | 8,397 | \$0.214 | 93.33% | 2,145 | 90.89% |
| | | | | | | | | |
| | | | | | | | | |
| 2009 | January | \$158.89 | 140.56% | 751 | \$0.212 | 126.43% | 0 | |
| | February | \$138.27 | 98.27% | 636 | \$0.217 | 88.95% | 0 | |
| | March | \$137.66 | 105.94% | 633 | \$0.217 | 96.35% | 0 | |
| | April | \$155.20 | 119.26% | 685 | \$0.227 | 104.10% | 33 | 103.13% |
| | May | \$140.82 | 113.39% | 618 | \$0.228 | 98.72% | 82 | 61.19% |
| | June | \$142.54 | 121.86% | 612 | \$0.233 | 106.43% | 117 | 25.00% |
| | July | \$247.60 | 164.20% | 1,008 | \$0.246 | 152.96% | 333 | 53.03% |
| | August | \$170.82 | 89.89% | 773 | \$0.221 | 96.38% | 431 | 90.74% |
| | September | \$128.44 | 75.78% | 565 | \$0.227 | 79.80% | 120 | 35.50% |
| | October | \$188.71 | 82.45% | 867 | \$0.218 | 88.38% | 5 | 7.58% |
| | November | \$108.40 | 68.14% | 581 | \$0.187 | 76.95% | 0 | 0.00% |
| | December | \$130.13 | 92.60% | 690 | \$0.189 | 103.45% | 0 | |
| | TOTAL | \$1,847.48 | 102.99% | 8,419 | \$0.219 | 100.26% | 1,121 | 52.26% |

Degree Days

Comparing heating and cooling patterns with degree days will show if there the building is being heated and cooled more than “necessary”. Temperatures vary throughout the heating and cooling seasons. If a programmable thermostat is not being used, adjusting to these fluctuating temperature changes may be difficult to remember. A degree day is a number which reflects the demand for heating or cooling. Beginning at 65 degrees, each degree higher or lower is one degree day. Go to

http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/cdus/degree_days/ddayexp.shtml

for a comprehensive explanation Heating or cooling more than the degree day reflects is inefficient and energy wasting.

Stewardship Opportunity #2 — Reducing and Conserving Energy

Only after monitoring home energy use is it possible to identify ways to reduce and conserve energy. Knowing how much energy is being consumed is the first step into reducing and conserving. Analyzing long-term energy use and identifying inconsistencies (e.g. electrical use in March is twice that of February or April) is a clear sign that there are energy use problems needing to be addressed. Even with the most efficient equipment, energy can still be wasted. Heating or cooling a building which is not in use, leaving lights on, or letting a shower run all waste energy ... and cost money ... and generate pollution! None of these reflect good environmental stewardship.

Getting a Home Energy Audit

It is necessary to know the building’s energy use before doing a home energy audit. If after finding out that home energy use is very high, then having a home energy audit is a great idea. An audit will help identify which areas of your energy use can be reduced, which appliances can be replaced, etc.. These audits are completely free of cost and take roughly 1 1/2 hours and are a HUGE benefit to you.

For more information on home energy audits, go to www.mipandl.org/ees.html and get MIP&L’s Everyday Environmental Stewardship report for Home Energy Audits.

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