# Making the Right Choice: The Guide to Choosing the Best Desktop Utility Bill Tracking Software for Your Facility

*John Avina, C.E.M.*
*President, Abraxas Energy Consulting*

ABSTRACT

Today's utility bill tracking software can deliver excellent results for energy managers who want to gain a comprehensive understanding of utility usage and costs in their facilities. All of the major commercially available utility bill tracking software programs are good at what they do; however, they are distinctly different in functionality and capacity.

Savvy energy managers have discovered—sometimes the hard way—the importance of selecting the appropriate software package to meet their needs. Before reviewing software packages, it is best to understand the needs of your organization and the resources available. Then you can compare each program's capabilities (such as budgeting and forecasting, temperature correction, rate analysis, report generation, etc.) against your needs.

Making the wrong choice can result in wasted time and hours of frustration, or worse—dissatisfied clients or management.

This article will help you to identify what tasks you want to accomplish with your utility bill tracking software.

## WHY NOT JUST USE SPREADSHEETS?

If you are tracking energy usage and costs for a handful of meters, a spreadsheet may be adequate; however, if you are tracking for a large organization with many facilities, or tracking savings from energy efficiency measures, then commercial energy accounting software may be the best and easiest way to track your utilities. Table 1 presents some positive and negative aspects of using spreadsheets.

## INTRODUCTION TO UTILITY BILL TRACKING SOFTWARE

All the major utility bill tracking software packages are good at what they do. However, they are all different and have different capabilities. Although you can track your utility bills effectively in any of the software packages, depending upon what your specific needs are, there is likely one program that is more suited to your needs than the others. Choosing the correct software package the first time can save you hours of work, and help you avoid the frustration of discovering too late that it does not produce what you wanted.

**Table 1. Positive and Negative Aspects of Using Spreadsheets**

| *Positive Aspects* | *Negative Aspects* |
|---|---|
| Spreadsheets are inexpensive. You probably already own Excel, and thus pay nothing for the software. | Tracking large numbers of accounts can greatly complicate the spreadsheet, sometimes to the point of absurdity. |
| You can create exactly the report you want in a | If you have a bug in the spreadsheet, you may never discover it, since very few people would use the spreadsheet, whereas canned software is used by hundreds of users who ferret out all the bugs. |
| You can understand every calculation in a spreadsheet (at least initially) since you put the calculations there in the first place. | If you are calculating energy savings from energy projects, it is likely you are using methods not acceptable by ASHRAE Guideline 14, the IPMVP, and FEMP guidelines. |
| Since most people know how to use spreadsheets already, there is no necessity for training. | Other people may have a difficult time understanding how you derived your calculated results. |
| | If you are tracking energy savings for clients, it is best to use standard methodology in standard third-party commercial software to present what appears to be (and hopefully is) unbiased and above-board results. |

## NARROWING DOWN THE SCOPE OF OUR ANALYSIS

To narrow down the scope of this presentation, we have made two rough classifications, which are detailed below. This article covers desktop (not web-based) utility bill (not interval data) software programs.

**Web vs. Desktop Applications**

Using the web to track your energy usage is useful for large organizations. Large companies dispersed around the globe can enter their utility usage and see reports comparing usage in Lubbock to usage in London. Central energy managers can then easily allocate energy costs across the enterprise and locate high-usage facilities and concentrate efforts there. However, enterprise web applications are usually relatively expensive and often offer only basic analysis functionality. There are a great number of web applications available, most of which focus on interval (e.g. 15-minute) data.

There are also some internet bill tracking services that are relatively inexpensive. These applications will present your data to you on the web in a number of ways, but at present appear to be limited in analytical capacity and functionality. For example, these web services typically will not weather normalize utility data, which results in faulty year over year comparisons of utility bills. These web services are not addressed in this article.

There are only a handful of utility bill software programs in the desktop market. Desktop applications usually offer more sophisticated analysis than their web brethren, and usually at a much-reduced price compared to web software. Many desktop packages offer some interface to the internet, such as downloading bill, interval or weather data, and creating html reports.

**Interval Data vs. Utility Bills**

Although there is considerable value to be found in analysis of interval data, there do not appear to be enough interval data experts to go around. Some organizations have paid hundreds of thousands of dollars for interval data enterprise software, only to have it go unused, often due to lack of trained and available staff that can gain meaningful information from it.

Interval data can be used for several purposes, some of which are listed below:

- Determining when equipment is turned on and off;
- Discovering and diagnosing equipment and controls problems;
- Load shedding;
- Aggregating energy usage across an enterprise into load profiles which can be used when procuring energy supply contracts;
- Applying rates to the interval data to get a better understanding of the hourly cost of running the facility.

Viewing utility bills in monthly (or billing) increments is a simpler discipline which is more comprehensible to management, more familiar to energy professionals, and more commonly practiced. Plenty of useful information about a facility can be gleaned from utility bills, some of which are listed below:

- Determining whether the facility is saving energy and utility costs.
- Identifying the most wasteful facilities.
- Identifying controls and equipment problems.
- Budgeting and forecasting.
- Understanding where utility costs are going.
- Performing rate analysis.
- Verifying that the utilities are billing correctly.
- Identifying changes in facility usage patterns.

As the topic of this article is utility *bill* tracking, we will not cover interval data analysis; however it is important to note that some desktop packages can handle both your utility bill and interval data, and can reconcile your utility bills with interval data.

## SOFTWARE SELECTION CRITERIA

Perhaps the best method of determining the software program for your specific needs and budget is to clarify what you want the software to accomplish. Below we have listed some of the tasks that utility bill

tracking software can help you perform.

There is a comprehensive questionnaire at the end of this article which will help optimize your software criteria.

- Are you more interested in utility accounting or energy analysis and saving energy?
- Do you need to identify the most inefficient facilities?
- Do you need to measure energy savings from your energy conservation projects or from performance contracts?
- Do you need to streamline your utility bill payment system?
- Do you need to create an incentive system to encourage employees to save energy?
- Do you need to verify that your utility bills are correct?
- Do you need to allocate costs from master meters to submeters and subsidiary accounts?
- Do you need to identify anomalous changes in utility usage?
- Do you need to understand the relationship between production at your factory (or occupancy at your hotel, etc.) and utility usage?
- Do you need to create budgets and track your utility costs against the budgeted costs?
- Do you need to evaluate different rate structures on your utility data to find the best rate?

Once you have determined your specific needs and budget, you can identify which software features are necessary to accomplish these tasks. This section lists features and selection criteria with which you can sift through the software programs to find the one best suited to your needs.

**Capacity: How Large A Project Will You Be Working With?**

The software packages currently available represent a wide range of capacity—from a low end of several hundred meters to a high end

of nearly unlimited accounts. If you are putting together a utility bill tracking project with thousands of meters, then the smaller software packages may not be applicable. Some of the desktop packages have SQL databases that can handle virtually an unlimited number of accounts. Some energy managers get around the database size limitations of the smaller desktop packages by keeping several databases, each corresponding to a different section of the organization. If you are responsible for hundreds or thousands of meters, you might find that it is not necessary to track all your meters. Tracking fire protection and street lighting meters may not result in any analytic value at all.

**Energy Accounting Method: Year to Year Comparison vs. Temperature Correction**

There are different ways to view your utility data. You can compare your usage from year to year to see if you are using more or less energy, or you can correct your energy usage for weather data, or other factors, such as occupancy or production.

If you compare utility usage from year to year, you can quantify the change in usage and costs. However, you cannot tell if the change is due to fluctuations in weather, changes in rate, changes to the facility itself (such as new additions, new equipment, or extra shifts), or due to reduction or increase in energy usage (which is what you are trying to determine). Energy analysts often prefer to normalize their data to weather, so that they remove these factors, and get a truer picture as to whether the facility is using more or less energy than it used to. Without weather normalization, they may not be able to tell if their project is truly saving energy, or instead, if the change in weather from year to year is responsible for changes in utility usage. This same type of normalization can be done with other factors as well, such as production, occupancy or calendar.

Not all weather normalization processes are the same. Some software packages have extensive normalization capacity, which allows energy analysts to extract the maximum from their utility bills, whereas other programs treat normalization as an afterthought and offer very little in reporting or analysis.

**Ease of Use**

Most of the programs are relatively simple for such tasks as data entry and report generation. These simple tasks can usually be per-

formed by clerical workers. However, the more complex tasks are best executed by energy professionals. These more complex tasks (such as weather correction, budgeting and forecasting, creating custom reports, modeling rates, etc.) are associated with concepts (such as demand, ratchets, weather regression, and prorating) that may require some technical knowledge and analytical skills. Untrained staff may be able to run the more complex software routines, but may be unable to assess the reasonableness of the approach or results.

Knowing that the more complex tasks may be more difficult to learn, it is probably best to judge general ease of use on the simple tasks, such as laying out your site and account information, entering bill data, and producing reports. The more complex functions, such as modeling rates, weather normalization, or budgeting and forecasting, by their very nature, will be more difficult in all programs. Some people are intimidated by these features in the more sophisticated programs, thinking that they are just too difficult.

It's important to remember, you can grow into these advanced features in time, just as most of us did with MS Excel. In fact, it is probably a wise long-term decision to purchase software that has some features you don't yet understand, as then you have reason and tools with which to grow and increase your skills.

Before buying the software, it would be best to take a "test drive" and see how intuitive the user interface is.

**General Orientation: Energy vs. Accounting**

Some software packages are more oriented towards accounting than analysis. Accounting programs will stress things such as entering all charges in the bill (which sometimes can be more than 6 different line items per bill), interfacing with accounting systems, aggregating data for payment, and creating bills for your tenants. Analysis programs will stress weather normalization, allow you to identify and cast out anomalous bills from your analysis, provide graphs displaying the relationship between weather (or production, etc.) and usage, and generally are mostly concerned only with usage, demand and total cost, but not all the little charges on the utility bill that make up the total cost. If your background is accounting, and not energy, then you will likely be more comfortable with an accounting-oriented program, rather than an analysis-oriented program. If your background is energy, you will likely be more comfortable with an energy analysis-oriented program.

**Interfacing With Your Accounting System**

Some software packages can interface with accounts payable for bill payment. Typically utility bills for a utility vendor are aggregated and can be exported for accounts payable. Some packages will create an export in any format you choose to accommodate existing accounting procedures.

**Importing and Exporting Data**

All software packages offer import and export of data. Usually you will have to properly format your data before importing it. Some packages allow you to import data from the text format in which you receive it from the utility. This custom import format is usually created by the software provider or a consultant.

**Baseline Modifications**

Buildings occasionally change their usage patterns. These changes can lessen the usefulness of annual comparisons of usage and costs. For example, if you were trying to track savings on a building for which you installed energy efficient lighting, and if the building subsequently adds a new computer lab (or a new addition, or a third shift), your building usage may increase. If you were trying to determine whether the building was saving energy from your lighting retrofit, you would no longer be able to separate the reduction in usage from the lighting from the increase in usage from the new computer lab. Some software packages will allow you to make "modifications" to the baseline to account for the new computer lab (or new addition, third shift, etc.), which allows you to determine what savings, if any, are attributable to the lighting retrofit.

**Rate Analysis**

There are four main reasons analysts may want to include rate analysis in their utility bill tracking project:

- To assure that costs are correctly applied to changes in usage and demand. Since using blended rates can introduce large errors, modeling rates is the most accurate method of assigning costs to usage and demand.

- To verify that the utility is costing bills correctly.

- To assign some agreed-upon cost to utility usage and demand, such as is sometimes done in performance contracting.
- To determine which rates are best suited for your accounts.

To analyze rates, the utility rate must be entered into the program. This can be done by the analyst himself, a consultant, or oftentimes by the software provider. Many utility rates have become very difficult even for energy professionals to decipher. If you are planning on performing rate analysis in your organization, you might want to have a plan for who is going to enter the rate into your software, as this sometimes can become time consuming.

Not all desktop software packages can model utility rates, and of those that can, some may be limited in how detailed a rate can be modeled. If you want to investigate rate issues, then determine if your own rate schedules involve provisions such as demand ratchets, fuel surcharges, time of use periods, load factor tiers, etc. and then see if the softwares you are looking at can handle these provisions.

**Allocating Costs to Submeters**

Some analysts use their utility bill accounting software to allocate costs from master meters to submeters or subsidiary accounts. For example, a mall that charges each different tenant for energy usage could use the software to allocate costs and usages based upon submeter readings (or other criteria such as square feet), and then create bills for the different departments.

**Reporting**

Once you know what tasks you intend to accomplish with your utility bill tracking system, you should have a fairly clear idea of the type of reports required to fulfill these tasks. However, the quality of reports, and the ease of creating reports, varies from program to program. In addition, in most programs the reports are generated in a canned format (Crystal Reports), which is difficult to modify. In the past, countless users of one software package were forced to create reports, export them to Excel, and then manipulate the reports to format them as needed.

**Emissions**

Reporting on emissions ($CO_2$, CO, $NO_x$, etc.) into the atmosphere

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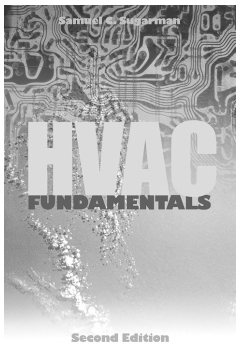


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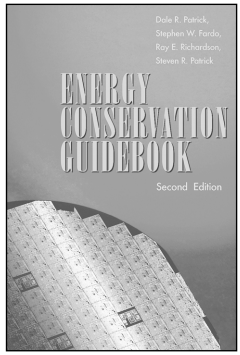


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is becoming more popular. While most energy managers think in terms of usage and dollars, management may be also interested in reporting $CO_2$ reductions to shareholders or the media.

**Software Cost**

The utility bill tracking programs currently available are priced from about $8,000 to about $90,000.

In addition, you might want to consider the cost to set up your database, which is usually extra. If you are busy, then the easiest and perhaps best method of starting your utility tracking database is to have an expert set it up for you. That way you can learn the program little by little as you enter data and make reports, while still having time to do the rest of your job.

**Services**

Consider your vendor as well. There are different types of vendors. What is their overall orientation? Is your vendor grounded in energy efficiency or energy accounting, or is your vendor primarily involved in selling software? The vendors associated with energy efficiency are the ones who will stress analyzing your bills, finding problems, and saving energy. Some of these vendors will teach you how to analyze your usage, spot problems, and find the actions to take to correct them. Those vendors grounded in accounting will focus on integrating accounting systems, and will have little help or advice when it comes to energy management decisions.

Some software vendors will sell you software, perhaps bundled with some services, and you will never hear from them again. Some vendors, on the other hand, will go the extra step to make sure that your utility bill tracking project is a success.

## OTHER FACTORS TO CONSIDER

Some factors to take into account when selecting a utility bill tracking package have nothing to do with the software itself, but rather with your own organization or the software provider.

**Staff Capability and Availability**

How sophisticated is your staff? How much time can it devote to

utility bill tracking? Having the best utility bill accounting tool in the world is not helpful if your staff does not have the knowledge or time to get the most out of it. Be realistic about your staff and who will actually be using the software. Software training by itself may not be enough. Understanding how to run the software, but not having a good grounding in energy, could lead to underutilization of the package.

In addition, it is very important to consider beforehand who will be doing what functions with the software. For example, clerical workers could input data and produce reports. Analysis and other heavy lifting might best be done by energy professionals. Do not expect your clerical staff to do more than it is capable of, or your bill tracking experience could end in failure.

**Support and Ongoing Costs**

Be sure to consider the availability and quality of technical support, and the associated costs. You might want to contact technical support with questions before purchasing the software, so as to get an idea of the quality of the support you will be getting. Most of the software packages come with the first year of support free, and an additional annual fee thereafter.

**Software Selection Questionnaire**

If you answer these questions before you investigate different software packages, you are more likely to end with the software that is best suited to your organization. Don't be swayed by sales people and bells and whistles. Get the right software for your organization.

*General*

- How many meters will you be tracking?
- What is your budget?

*Analysis*

- Do you need to identify the most inefficient facilities?
- Do you need to measure energy savings from your energy conservation projects or from performance contracts?
- Do you want to compare year-to-year bills or use weather normalization?
- Do you need to identify changes in utility usage patterns and spot outlier bills?

- Do you need to understand the relationship between production at your factory (or occupancy at your hotel, etc.) and utility usage?
- Do you want the ability to modify your year-to-year comparisons for changes in usage patterns such as new equipment or building additions?

*Accounting*
- Do you need to streamline your utility bill payment system?
- Do you need to allocate costs from master meters to submeters and subsidiary accounts?
- Do you need to create budgets and track your utility costs against the budgeted costs?
- Do you need it to interface with your accounting system?
- Do you want to enter in every charge associated with your bill?

*Data Manipulation*
- How are you going to get data into the system? Importing monthly data files or hand entering?

*Rates*
- Do you want to verify that your utility bills are correct?
- Do you need to evaluate different rate structures on your utility data to find the best rate?
- Do you want to apply the current rate to before and after comparisons of utility costs?

*Reports*
- What type of reports do you want the software to generate?
- What are you going to do with reports when you get them? Print them? Email them? Modify them on your computer? Save them?
- Do you have special reporting needs? Will the software allow customized reports? How easy and expensive are customized reports? Can you do it yourself?
- Do you want to report on emissions ($CO_2$, CO, $NO_x$, etc.)?

*Staff*
- How sophisticated is your staff?
- How much time can it devote to utility bill tracking?
- How much time and resources do you have to train staff on software?

*Services*

- Are you going to create your own bill tracking database, or are you going to have it done?
- How is technical support?
- Will you want your vendor to be available to partner with you? If so, how? Helping with software questions? Helping you understand what your bills are telling you?

Also, be aware that most likely none of the packages available will have all of the features you want, or all of the features you want at a price your organization is willing to pay. In this case, you are going to have to prioritize the features in the questionnaire, and from there pick the software that handles the most important tasks your organization requires.

## CONCLUSION

All the major desktop utility bill tracking programs can be used to successfully track utility usage and costs. However, each of the major desktop utility bill tracking software programs has useful features especially designed to fit certain situations. To ensure that your utility bill tracking project is successful, it may be best to understand exactly what you need to accomplish and who will be doing the work. Once you are clear on your objectives and personnel, you can select the program that best suits your needs and budget.

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ABOUT THE AUTHOR

**John Avina**, president of Abraxas Energy Consulting, has worked in energy analysis and utility bill tracking for over a decade. During his tenure at Thermal Energy Applications Research Center, Johnson Controls, SRC Systems, Silicon Energy and Abraxas Energy Consulting, Mr. Avina has managed the M&V for a large performance contractor, managed software development for energy analysis applications, created energy analysis software that is commercially for sale, taught over 200 energy management classes, created hundreds of building models and utility bill tracking databases, modeled hundreds of utility rates, and set up and maintained M&V projects for a handful of 500 to 1000

unit big box store chains. Mr. Avina has an MS in mechanical engineering from the University of Wisconsin-Madison. He is a member of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), the Association of Energy Engineers (AEE), the American Solar Energy Society (ASES), and a Certified Energy Manager (CEM). Mr. Avina can be reached at johnavina@abraxasenergy.com.

Abraxas Energy Consulting provides utility bill tracking and energy management services for its clients worldwide. In addition to representing all of the major utility bill tracking software packages, Abraxas Energy Consulting creates, maintains, and analyzes utility bill tracking databases, trains its customers in energy analysis and software, and performs building energy audits and measurement and verification for ESCOs and facility managers. Further information on utility bill tracking software (and free demos) can be found at www.energy-accounting.com.