

National Action Plan for Energy Efficiency Sector Collaborative on Energy Efficiency

Overview of Utility Data Availability and Proposed Best Practices to Facilitate Energy Benchmarking

Introduction

The use of energy performance benchmarking has been estimated to stimulate usage savings of between 4 percent and 30 percent, typically by identifying low performing facilities with large potential for cost-effective improvements to make them more energy efficient. Building owner and manager use of energy benchmarking is growing, but it has yet to become a widespread practice. Several factors have contributed to the slow rate of adoption, but one significant reason is that utility billing data are rarely available to end-users on a timely, on-going, inexpensive, and convenient basis. The North American Energy Standards Board (NAESB) identifies the problem in a white paper prepared in response to a request from Wal-Mart Stores, Inc. to develop nationwide standards for electronic transactions between utilities and end-users:

“Commercial and industrial retail customers (C&I customers) doing business nationwide conduct business with many different energy companies, both natural gas and electric, that each has its own unique way of invoicing for services. The choice of composition and format for the invoice, in addition to choosing a method of delivery to send monthly billing and payment information, is usually left to the billing party.

The problem for a C&I customer doing business across many different jurisdictions is that it receives many different types of bill formats such that no two look alike. Obviously then, the accounts payable clerk must visually scan each bill in its entirety to gather the specific billing and payment information necessary for input into the accounts payable ledger. This search for information is further complicated by the need to separately record the different types of charges found on many invoices; for example, energy charges as distinguishable from other non-consumption services provided.

In addition to gathering information for the accounts payable function, many C&I customers gather consumption related data from utilities that is useful in managing their energy usage; a prime example is metered consumption data. Traditionally, this type of data is made available in paper form that may or may not accompany the paper invoice; on an electronic disc; or by downloading the information through secure Internet websites.”... Wal-Mart Stores, Inc. asks that the composition of the end-user’s retail energy bill be defined and established for Uniform Electronic Transaction application as communicated between the Billing Party and the end-use customer.”¹

Facilitating widespread commercial building energy performance benchmarking is a goal of the National Action Plan for Energy Efficiency (NAPEE) Sector Collaborative. Critical barriers to achieving this goal include the variations in energy consumption data provided to end-users and the complexity of accessing

¹ www.naesb.org/pdf2/req_rgq_bps092905w1.doc

these data.

The objectives of this overview are to characterize these barriers, to begin the process of identifying those energy providers that have successfully overcome them, and to develop a suite of best practices for making basic energy consumption data more widely available. This overview therefore considers (at a preliminary level):

- The nature of benchmarking activities and the benefits they can provide, along with the basic input and data requirements
- Current industry practices for the provision of data in a variety of situations (e.g., small versus large customer base, regulated versus competitive commodity market)
- Technology developments that may make the future provision of data more cost-effective
- Feedback from end-users, utilities, and other interested parties, and
- Relevant standards that have been, or are being, developed.

This overview identifies several important trends and practices and provides recommendations for data provision, as well as next steps for NAPEE efforts.

Current Utility Data Practices

The Environmental Protection Agency's (EPA) energy performance rating system provides a framework for discussing the data requirements of representative benchmarking systems. This tool, like most others developed in-house by large end-users or which are available from independent service providers, requires as a starting point at least 12 months of historical energy use. These data are then updated, typically monthly, with the energy use data for each site in the end-user's portfolio of facilities.

Utility practices vary widely when it comes to providing these data, and include:

- Provision of copies of utility bills
- Paper-based consumption histories based on a written request
- Web site viewing of data
- Customer download of historical data in text or Excel format
- Web site access to consolidated historical data across multiple accounts
- Free or purchased software to analyze and/or download consolidated consumption data, including interval load data
- Electronic Data Interchange (EDI) of invoices
- XML-based transfer of billing information, and
- Other systems (such as automated distribution of updated Excel spreadsheets).

The most common practice among investor-owned electric utilities that provide consumption data is to permit password-protected Web site access to view consumption data in tables. From these tables, customers may cut and paste consumption information into their own data collection format. This process can be time consuming and introduces the possibility of human error. A direct export of data from online access is not a common basic feature, although some utilities do offer this service.² Puget Sound Energy, for example, provides customers with an Excel data export feature that some customers use to transfer data into a third party energy information system called Utility Manager.³

An alternative approach has been found attractive by certain National Account customers, wherein a third party service provider develops an interface to the utilities' billing systems and the customer polls the service provider's database for benchmarking information.

Large utilities (and quite commonly large retail electric providers) will sometimes provide software to large customers to help analyze and export data, including hourly-interval load data. Southern California Edison (SCE), for example, provides all customers with more than 200 kilowatts of demand and Smart Meters with SCE's Energy Manager software. Energy Manager allows customers to export their data in Excel format.⁴

An important feature for some end-users is the consolidation of multiple accounts within a single utility territory. This feature is particularly useful for large companies who already work with tens or even hundreds of utilities. However, this functionality can be a challenge for utilities with older customer information systems to offer since they often cannot easily associate individual accounts with master accounts.⁵

Utility selection of practices, and decisions to invest in the systems necessary to support those practices are often driven by two factors: 1) the degree to which regulators require the provision of the data and have permitted the utility to recover the costs for development of the systems, and 2) the utility's perception of the value of benchmarking and the likely demand for a service through which data are more readily made available. Utilities may underestimate the level of benchmarking undertaken by their customers, assuming that customers would not use available data to perform their own analysis and benchmarking. While this may be true of some customers, there are many customers who want to

² Adam Marks, Senior Product Manager, Nexus Energy Software, interview on May 15, 2007.

³ David Van Holde, Acting Account Executive Office Manager, Seattle City Light, interview on April 30, 2007.

⁴ Chris Buntine, Project Manager, Southern California Edison, interview on May 15, 2007.

⁵ Adam Marks.

benchmark on their own⁶. This is evidenced by the more than 33,000 buildings utility customers have rated using EPA's rating system and the willingness of customers to pay for popular energy tracking and benchmarking software programs such as Facility IQ, Utility Manager, and EnergyCAP. And, while much of the demand for benchmarking has historically come from large multi-site customers, it should be noted that even single-site small and medium sized customers also benefit from benchmarking data. Indeed, it is likely that they benefit more than the typical large customer (on a per site basis) since they typically have lesser access to the performance metrics and comparative trends that can be effective in identifying energy savings opportunities.

Data Format, Protocols, and Standards

While there are a wide range of practices, perhaps the most important requirements are (1) that data be accessible in a consistent electronic format (across both different accounts with the same supplier, and across accounts with different suppliers), and (2) that it not require a manual interrogation of the utility's Web portal for each location and each new month of data. Meeting these requirements would permit end-users to analyze the data themselves or permit access by a service provider or benchmarking system for analysis.

The utility industry has been aware of customer requirements for data availability for many years, and has previously developed protocols and standards that have laid the foundation for widespread data availability. In the 1990's, the Utility Industry Group (UIG), a voluntary, not-for-profit, industry action group dedicated to the advancement of electronic commerce, electronic data interchange (EDI), and electronic business processes within the utility industry led the development of standards for the delivery of customer invoices (including consumption information) through EDI. This complex standard sets forth very specific electronic file formats and data elements, and for customers who agree to receive and pay their bills through EDI, this can be a useful way of collecting the required data.

However, EDI requires a significant investment in software, hardware, and processes by both the utility and customer. Generally, EDI has been actively considered only by large utilities (those with over 1 million customers), and customers with many different facilities. Even then, it has been implemented with varying degrees of success. For example, Wal-Mart Stores, Inc. has stated publicly that:

"In service territories where the utility offers EDI billing, the customer experiences a wide variety of EDI standards and requirements. Although EDI has been in existence for more than 20 years and is a normal means of transacting business in most industries, it has not seen similar levels of success in billing transactions between energy utilities and their retail customers."⁷

⁶ Note that a variety of service providers will collect an end-user's utility bills and enter the data into a benchmarking or energy accounting software package. However, this intermediate step adds cost and complexity to the process, and many customers would prefer to capture the data themselves.

⁷ NAESB R05016, Request for Initiation of a NAESB Standard for Electronic Business Transactions or

In an effort to advance the availability of invoice data, NAESB began development of Model Business Practices (MBPs) in September of 2005. A number of utilities who participated in the MBP development process are also participating in NAPEE, including: Ameren, American Electric Power, Baltimore Gas & Electric, Duke Energy, National Grid, and Southern Company.⁸ According to NAESB:

“The focus of these Model Business Practices is the exchange of Customer billing data and the notification of Customer payments via Uniform Electronic Transactions when the Billing Party and the Customer have agreed to such an arrangement. These Model Business Practices apply to both competitive and non-competitive electric and natural gas markets. These Model Business Practices set forth the responsibilities of, the information formats to be followed by, and the information delivery methods to be utilized by both the Billing Party and the Customer. These Model Business Practices do not address the details of electronic transactions between the Customer and its financial institution, between any two financial institutions, or between the Billing Party and its financial institution. These Model Business Practices address the needs of national, commercial, industrial, and institutional Customers.”⁹

The NAESB MBPs are different from the UIG/EDI standards in that they describe more *what* a utility should do rather than *how* it should do it¹⁰. After extensive industry review and comment, NAESB adopted a set of voluntary MBPs. If adopted broadly, these MBPs should significantly increase the availability of data for benchmarking by encouraging utilities to adopt the following practices¹¹:

RXQ.9.3.1.1 The Billing Party may elect to offer Customers, and Customers may elect to accept or reject, the option of receiving bills and making payment notifications via Uniform Electronic Transactions, in lieu of, or in addition to, issuing a paper bill.

RXQ.0.2.42 Uniform Electronic Transactions [are defined as] Standard data arrangements for trading information, making business requests and exchanging other information, encompassing a number of electronic media and utilizing specified transport protocols.

RXQ.9.3.2.1 The Billing Party should issue the bill to the Customer via Uniform Electronic Transaction

RXQ.9.1.1 The methods used by the Billing Party for sending a bill to and receiving payment notification from the Customer via Uniform Electronic Transactions should be efficient to minimize the time and effort required to complete the overall process.

RXQ.9.3.2.3 Uniform Electronic Transactions for billing should be submitted at the Billing Party account number level.

RXQ.9.3.2.6 Bills issued to Customers by the Billing Party via Uniform Electronic Transaction should contain the data elements found in RXQ.9.6.1.3. At a minimum, the following business information should be included:

Request for Enhancement of a NAESB Standard for Electronic Business Transactions, June 17, 2005, Submitted by Wal-Mart Stores, Inc.

⁸ A sample of additional participants in the NAESB MBP development process includes: Alabama Power Company, Allegheny Power, Alliance Data, Alpine Corp., Calpine Corp., CenterPoint Energy, Cinergy, Detroit Edison, Dominion, EC Power, EnCana Corp., Energy Services Group, ERCOT, ESG, Gulf Power Company, Maine Public Advocate, Mississippi Power, National Fuel, Old Dominion Electric Coop, PICO Energy, PSE&G, Savannah Electric, TXU Electric Delivery, and Wisconsin Public Service.

⁹ Ibid.

¹⁰ Note that NAESB is in the process of developing additional standards for EDI transactions through technical subcommittees which will provide additional guidance regarding how the business practices can be implemented.

¹¹ http://www.naesb.org/pdf2/retail_bps013107w6.doc. Note that the above is a small excerpt of the NAESB MBPs, which cover a range of other issues, including electronic payment. It is suggested that the reader review the NAESB MBPs in their entirety

- Invoice number (unique number associated with this individual invoice)
- Date of invoice
- Invoice due date
- Type of invoice (original, cancel, or final)
- Type of meter reading (actual or estimated)
- Billing type indicator (e.g., Distribution Company standard offer billing , Dual Billing, Consolidated Billing)
- Billing Party account number
- Service Delivery Point identifier, if applicable
- Non-Billing Party account number where available
- Product code (electric or gas)
- Meter reading start date
- Meter reading end date
- Quantity used
- Unit of measure (kWh, ccf, Mcf, etc.)
- Rate code
- Total amount of previous bill
- Total payments received since last bill
- Outstanding balance prior to current period charges
- Current period charges and adjustments, at the appropriate level of detail
- Taxes on current period charges where required
- Tax type code (e.g., state, local, gross receipts)
- Total amount due
- Billing Party name (sender)
- Billing Party contact name
- Billing Party contact phone number
- Non-Billing Party name
- Non-Billing Party contact name
- Non-Billing Party contact phone number
- Non-Billing Party type (e.g., Distribution Company, Supplier)
- Customer name (receiver)
- Customer service address
- Customer contact name
- Customer contact phone number

In addition to the guidance becoming available through the development model business practices, other factors will influence how utilities approach making data more available to their customers.

Technology has advanced significantly since the development of EDI, and recent developments are making the management and exchange of billing data more cost-effective. For example, Extensible Markup Language (XML) has been chosen by the EPA as the technology to accept automated transfers of energy data into its Portfolio Manager benchmarking system, and several California investor-owned utilities have adopted the XML model to transfer data to EPA's rating system. Further, it is estimated that at least 30 utilities have permitted an XML interface between their billing systems and the databases of third party service providers. XML places fewer requirements on customer systems than does EDI, and even for utilities that have a large investment in EDI, XML can provide a comparatively inexpensive and flexible means of data exchange¹².

¹² Note that since technology, billing, software, and benchmarking vendors will play a significant role in creating systems that build upon any future standards or technologies, it will be important to include them in the standards and practices development process.

Finally, utilities are gaining implementation experience with various approaches for providing customers with data. In fact, some utilities are already offering customers several different mechanisms for retrieving their billing data. ComEd, for example, provides three options to customers¹³:

1. Electronic billing (similar to electronic billing for most other utilities and enabled through the CheckFree service) including the ability to download certain data to Excel
2. EDI, and
3. Transall Electronic Summary Billing (ESB) offered to customers with five or more accounts, and in which an Excel spreadsheet summarizing data from all accounts and providing macros for posting and payments is automatically emailed to customers.

The implementation experience that the industry accumulates will assist other utilities in structuring their approach to making data available to their customers.

Model business practices, advances in technology and field experience are all factors that will influence how utilities make data available to customers in the future. To date, utilities have understandably tended to develop practices that responded to their own regulatory, financial, competitive, infrastructure, and customer requirements. On the other hand, it is easy to understand the frustration customers experience when faced with an array of systems. Fostering common business practices throughout the utility industry will facilitate customer energy management and benchmarking activities.

Best Practices for Making Utility Data Available to End Users

The industry stands on the cusp of technology and business process developments that may (with the alignment of several forces) permit rapid, widespread standardization of the data needed for benchmarking. Despite this, there is not yet utility industry consensus regarding these issues.

The proposed NAESB standards provide an excellent foundation (both in terms of content and the development process) for future progress by establishing the basic requirements of utility bill information exchange between end-user and supplier. We recommend discussing the possibility of reinforcing and extending the NAESB standards with the adoption of additional “Best Practices” at the NAPEE Sector Collaborative meetings on June 27 and 28, 2007. We recommend adoption of two classes of Best Practices, “Universal” and “Advanced.” Universal Best Practices include:

1. Providing electronic access to end-users for monthly invoice and consumption data in a consistent, nationwide, industry standard format addressing at least: security, content, file layout, accuracy, and labeling of the data, and
2. Permitting end-users to receive the data, even if they do not intend to pay bills electronically.

¹³ www.exeloncorp.com/ourcompanies/comed/comedbiz/your_account/pay_your_bill/electronic_billing_and_payment/

Advanced Best Practices build upon the Universal Practices for those utilities in a position to make additional investments in the necessary IT and support systems. The Advanced Best Practices include:

3. Automatic distribution of monthly consumption data to customers without the need for customer intervention
4. Providing automated electronic access to consumption data by the customer's (or a designated third party's) benchmarking or data collection system
5. Developing single data transmissions that consolidate data across customer-selectable multiple accounts and facilities
6. Provision of the data at a cost that recognizes the efficiencies associated with electronic data transmission and the possibility for induced energy efficiency actions – and preferably at little or no charge to the customer
7. The development of processes that, while taking advantage of technological developments, lend themselves to integration with a wide variety of legacy systems and potential migration to future technology platforms
8. Active encouragement of customer use of the data for benchmarking and tracking, and the free or subsidized provision of software and services designed to enable such use, and
9. Incorporation of access to interval consumption data and load profiles.

Next Steps toward NAPEE Leadership Group Guidance

One goal of the NAPEE Collaborative is to advance a set of recommendations to the Leadership Group that could be issued as guidance to the utility industry. The following are proposed next steps to advance this effort:

- Achieve Design Team consensus on the proposed best practice recommendations
- Conduct outreach and coordination with key stakeholders (e.g., NAESB, end-users, software vendors, etc.)
- Prepare final guidance on best practices to forward to the Leadership Group
- Leadership Group review of the proposed guidelines and incorporation of revisions, and
- Issuance of guidelines as a product of the NAPEE process.

In issuing guidance in this area, the NAPEE Leadership Group will advance utility industry procedures, resulting in less burdensome and more cost-effective benchmarking and energy management by their customers.