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Is Energy Worth Your Time?

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Is Energy Worth Your Time?

Energy issues have muscled their way to center stage early in 2001, as gasoline prices broke the $2.00 per gallon barrier, Californians coped with 'rolling blackouts' and the bankruptcy of Pacific Gas & Electric, and on May 16 the National Energy Policy Development Group led by Vice-President Cheney issued its 170 page report.

The 'crisis' has not spared the healthcare sector. Now that it has our attention, in the form of higher prices for utilities and inflationary impacts on virtually everything that is bought by the healthcare industry, the question is "What can we do about it?"

How did we get here?

Let's begin by listing the major changes that have occurred in the energy arena over the last few years:

- The public utilities marketplace — electricity and natural gas — is in the throes of a transformation due to deregulation. While timelines vary on a state-by-state basis, the trend is clearly toward a more open marketplace with institutional consumers enjoying wider choices of who produces electrical and natural gas utilities, who delivers the utilities to their doorstep, and the terms under which they are supplied. A myriad of new 'unregulated' players are offering new business models.

- Institutional loads and consumption have grown during the 'internet boom' years of the late 1990's as we became a wired nation. All of the marvelous advancements in computing and communications have come at a not-insignificant energy price, both to power the devices themselves and to deal with the heat rejected by them, so that now facility-related usage accounts for over one-third of the nation's energy consumption. In healthcare facilities three trends have been at work: (1) advancing medical technology has increased both 'plug loads' and environmental heat loads; (2) as healthcare facilities have been replaced or renovated in recent years, interior space allocations and amenities have been upgraded to resemble some of the finest hotels, and more elegant space means more energy for heating, cooling, and ventilating; and (3) the increased activity and level of intensity of healthcare being delivered has added to facility energy loads.

- Prices have become more volatile as a consequence of deregulation and growth in demand. For example, since January, 2000 the demand for natural gas has risen by 5% nationally while the supply has risen by 1%, causing prices to rise in some places from the $2.00 per MCF range to the $5.00 range. Fortunately, new production coming on line over the next 18 months will drive prices back down.

- The nation's generating capacity and the physical networks delivering both electricity and natural gas are straining to accommodate the deregulated marketplace, leading to lower reliability of supply.

Against these changes increasing scarcity and the price of utilities, we have seen these technological advancements in building systems:

- New technologies for 'on-site generation' of electricity such as microturbines and fuel cells are beginning to appear in tests and demonstration projects at a few healthcare institutions and may soon be ready for broad adoption. These will provide owners with options to control somewhat the quantity and pricing of their energy purchases by partially 'unplugging' from the public utility infrastructure when advantageous.

- A steady improvement in the energy efficiency of fixed building equipment has quietly taken place over many years now. Usually nowadays the replacement of major equipment items such as chillers at their life-cycle end yields a significant savings in energy consumption.

- More sophisticated and 'real time' building operations strategies have emerged as component-level intelligence has begun to be incorporated into building controls systems, yielding greater energy efficiencies and closer matching of environmental conditions to occupant requirements.

In short, the management of a healthcare institution's energy procurement and consumption has gotten a whole lot more complicated in the last few years as the energy industry has deregulated just like the airline, brokerage, and telecommunications industries before it. Prices are more volatile — but more reflective of the day-to-day laws of supply and demand. Continuity of supply is less certain — but reliability is available and comes with its own price tag. And deregulation is leading to an explosion of choices for the buyer both in technology and in transaction design.

What can we do about it? —

We offer this exercise to healthcare executives whose interest in energy issues has been piqued.

EXERCISE #1 ***Pick a favorite wing or building and then pay a call on your Director of Housekeeping. Ask how much was spent last year in the cleaning of your 'test wing.' Chances are good that he or she will be able to tell you in short order (with perhaps a bit of estimation on the cost of paper products and chemicals). Next ask your Director of Facilities how much was spent maintaining the test wing. Again, chances are at least 50-50 that you'll get a reasonably accurate account of maintenance labor and materials from the department's work order system. Work contracted to outside firms is another matter.***

Finally, ask how much was spent on energy for your 'test wing' last year…..

In the bonus round call the architect designing your next building expansion. Ask how much energy it will consume once operational…..

For many years and across many healthcare organizations energy has been unmanaged, perhaps understandably. First, it accounted for only a minor part of the organization's operating expenses. Second, pricing was regulated and thus predictable. Third, opportunities for daily, active management of consumption were very limited. And fourth, reliability of supply was a given. An investment of time and money in the management of energy was unlikely to result in either significantly reduced costs or significantly lower business risks.

Should we even try to manage energy?

Your first decision is whether a new approach to energy management is worth the expense and effort. The answer lies entirely in where your health facility is located, and when the deregulation movement will hit your state. It would be prudent to have your energy ducks in a row before that date.

EXERCISE #2 ***Ask your CFO, your Director of Purchasing, and your Director of Physical Plant to a meeting and pose the question 'When will natural gas and electricity rates be deregulated for institutional customers such as ourselves in our state?" See who knows how much about the situation and whether they agree on an answer…..***

Moving from an unmanaged condition — where no explicit energy policy or strategy exists, and little is known about the actual patterns of energy consumption — to a well-implemented plan can yield big savings. Many hospitals have seen improvements in the range of 15% to 25% of total consumption. Given

the volatility of pricing these days, it is difficult to translate reductions in energy consumption into dollars saved, but as prices move upward the impact of reduced consumption is amplified.

Only you can set the priorities for your own organization, but here are a few signals that the time may be ripe for your institution to focus on energy:

- When you performed the exercise described above you found that energy consumption is not well documented, or even well understood within your organization;
- Much of your property portfolio is 'middle-aged,' in the range of 15 to 30 years old, and thus has major mechanical systems and equipment is nearing the end of their life-cycle, watch for the next article;
- Your facility manager tells you that you either don't have a building automation system at all, or that yours is of limited capability;
- Salesmen are calling on you offering all sorts of energy services (these guys do target their sales efforts, after all!)

Where to begin?

A key first step in the process of discerning the potential benefit of an energy management program is to gain a basic historical perspective on energy in your institution.

EXERCISE #3 ***For a meaningful period (say the past five or ten years) you should seek basic annual data on:***

- ***The size of the physical plant being operated***
- ***Energy cost per square foot***
- ***Energy consumption per square foot (measured in Btu's)***

in order to understand the impacts of growth in physical plant, changes in energy consumption, and energy pricing on your overall energy spending.

Ask your Director of Physical Plant for a report on this and then ask him how long he thinks it will take to pull the information together.

Once you have concluded that energy is worth managing, you need to decide whether the time is right for initiating a major energy management program. Is there a consensus among management at all levels — governance & CEO, the 'executive management' or VP level where institutional priorities and resource allocations are hammered out, and within the facilities organization itself — that an energy management initiative is worthwhile and worthy of support? Does it rise to the top of this year's (or next year's) institutional priorities when considered against the upcoming tri-annual Joint Commission survey, or a string of Type I deficiencies from last month's JCAHO survey that need fixing, or turning around a $20 million operating loss, or a pending merger with Community Hospital down the block? If not, perhaps it's better to defer the effort by a year, or to trim its scope to fit institutional realities.

A second point worth noting is that the state of your physical plant goes a long way toward shaping your energy management program. If you have a very new physical plant, it is likely that your M-E-P systems are close to state of the art, and thus the opportunities for big-time energy conservation through system modifications may be limited. In this case, the emphasis is probably going to be on procurement, operations, and maintenance. If you have a very old physical plant, the overall issues of facility replacement may well render the opportunities for energy conservation in the current plant moot.

Outsource?

If the timing is right you have another major decision to make. Do you outsource energy management or do it with your own staff and resources?

Outsourced energy management is the primary business line of 'ESCO's', or Energy Services Companies. Some of these firms are unregulated subsidiaries of public utilities (Southern Company's Energy Solutions, LLC is an example) while others have their origin in other segments of the energy industry such as production and transmission (ENRON, for example). Of course, the established players in outsourced facility management also offer extensive energy management services as part of their package (ServiceMaster, Sodexho / Marriott, etc.). Finally, several vendors of HVAC and electrical equipment and controls have established complementary business units offering facility and energy management services (Trane, Johnson Controls International, Siemens Building Technologies, and others). So you have many vendors to choose from, and a variety of business models being offered by them.

Generally, these vendors will assist with the upgrade, construction, design and operations of the energy infrastructure that a modern healthcare campus requires. The financing of infrastructure improvements can be done in a variety of ways. At the extreme, deals are being put together today that actually sell an institution's existing MEP infrastructure to an energy outsourcer at about 75¢ on the dollar. Under such a 'recapitalization' scheme the vendor owns, operates, and maintains the infrastructure and the institution buys the conditioned air flowing out of diffusers and the electrical current flowing out of wall receptacles under a 'utility' model at rates that cover the vendor's costs and profits. Virtually all financial risk is shifted to the vendor.

Another major deal done last year involved the vendor making a 'pre-payment' of a future guaranteed stream of energy savings to the customer. What's possible these days is limited mainly by the creativity of the participants.

ESCO's and other energy outsourcers bring two finacial capabilities to a deal: access to capital and energy price risk indemnification. Typically vendors will 'front' the cost of infrastructure improvements aimed at reducing energy consumption. These are financed either internally or through a third-party, and repayment is made out of customer savings on energy. In effect, part of the customer's spending on plant operations is diverted from energy to installment payments. Vendors manage energy pricing risk by aggregating their clients' energy buys and other risk management devices.

Numerous financial arrangements are possible, ranging from a straight fee-based management contract to performance contracts that share and / or guarantee savings and finance infrastructure improvements. While fee-based outsourcing can be done on a short-term basis, performance contracts generally have terms of ten years or longer so that the ESCO can recoup its investment or guarantees.

It is important to distinguish among the management, financing, and pricing risk indemnity services provided by an ESCO under an energy management deal. You should seek to understand how much you will pay for utilities and what you will pay for other services.

Insource?

If, instead of outsourcing, you decide to use internal resources to improve energy management, you should take care to integrate this initiative as one focus of your ongoing asset management program. Note that this doesn't mean "overlay these duties on your current facilities staff with no additional resources." Plan on investing in external consultants, additional staffing (for all but the smallest facilities), capital funds for technology, and your time to steer the institutional 'buy-in' and policy aspects.

Remember that energy is a 'consumable' and is in a sense the 'scorecard' rather than the object of energy management. Think of the term 'energy management' as shorthand for management of (1) the procurement of primary utilities — electricity, natural gas, fuel oil; (2) the assets that convert the energy contained in primary utilities to intermediate forms — steam, hot water, chilled water; (3) the assets that con-

stitute energy 'loads' — artificial lighting, air handling units, terminal heating equipment, etc.; and (4) occupant satisfaction with environmental conditions (within the parameters of an institutional energy policy). Opportunities for cost savings, greater reliability, and improved service to building occupants exist in all four areas.

How to integrate an energy management focus into your institution's overall program of asset management? Here are the classic asset management steps, with some suggestions on how energy management might adjust them:

1. **inventory** your assets

   A comprehensive facility asset management program begins with a complete inventory of maintenance-significant facility systems, components, and equipment.

   The basic facility asset inventory data already used by an institution needs to be enhanced in two ways to serve the needs of improved energy management. First, it is likely that utilities metering will have to be augmented so that the energy consumption of individual buildings or major additions can be isolated. Second, metered electrical consumption must be recorded on a 'real-time' (per 15 or 30 minute period) basis so that an electrical 'load profile' can be developed for the institution. Under deregulation, this record of the institution's daily pattern of electrical power usage will be used by energy suppliers to formulate pricing offers.

2. **assess** the condition and performance of the assets

   A comprehensive asset management program includes periodic assessment of facility assets as to their condition, regulatory compliance, functional adequacy, and other performance factors (including energy efficiency). This data forms the basis for planning of life-cycle replacement, modifications, and maintenance efforts.

3. **analyze** and **plan** a strategy for asset retirement, acquisition, and modification using a return-on-investment model

   The point here is to build a schedule for planned equipment life-cycles taking into account all performance factors, including energy efficiency. For some equipment good stewardship may mean giving it the appropriate periodic maintenance to extend its useful life. However, in the case of certain assets such as standard efficiency, large horsepower motors this may be exactly the wrong approach. Immediate replacement with high efficiency motors may pay large dividends in terms of reduced electrical power consumption.

   Energy considerations should be incorporated into the institution's development policies. Most states now have 'energy codes' setting broad constraints on energy consumption for new buildings and major renovations. With such a code as a starting point, the institution should provide specific guidance to its retained architects and engineers designing building additions / modifications as to their energy efficiency goals.

4. **implement** the plan

   Once the plan is in place, a reasonable pattern of capital investment will be necessary to implement the plan. Generally speaking, it should be implemented as quickly as possible, with the following factors acting to limit the rate of progress: ability of the institution to fund the capital investments necessary, ability of the facilities team to manage the planning, design, and construction / installation of improvements, and ability of the operational units to put up with the interim disruptions that are inherent to such building system modifications.

5. **operate** and **maintain** the assets for optimum life and energy efficiency

   Finally, as modifications are completed an 'energy management department or unit' needs to be charged with the clear and focused mission of operating and maintaining building systems with an eye toward energy management. We can identify four functions of this group: (1) procure primary utilities at the best price and with the best assurance of reliability; (2) manage building loads and energy conversion equipment on a 'real-time' basis to minimize costs while meeting the needs of the facility's occupants, under an institutional energy policy; and (3) maintain systems and equipment in top operating condition through a program of preventive and predictive maintenance.

In the healthcare energy game, the stakes are high and getting higher. In a recent study of real estate occupancy costs at a major academic health system we found that spending on plant operations broke down roughly into thirds: one-third for labor, one-third for contracts and commodities, and one-third for utilities.

EXERCISE #4 ***Think about how much time and effort you and your management team spend on staff-related matters in the plant operations area: recruiting, hiring, training, supervising, reviewing employee performance, compensating, managing benefits packages, retaining, motivating, negotiating collective bargaining agreements, arranging company picnics, hearing grievances, terminating, etc.***

Next, think about how much time you and your management team spend on supply-chain-related matters in the plant operations area: pre-qualifying vendors, setting up blanket contracts, e-procurement, group purchasing activities, preparing specifications, bidding, cutting releases, sourcing parts, managing inventory, matching invoices, authorizing payment, etc.

Finally, think about how much time you and your management team are devoting to the management of energy consumption and spending. Do you need to shift your organization's priorities?