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## Energy Management: Reducing Operating Expenses, Improving Bottom Line & Increasing Value of Business

I've attended a couple of energy-management conferences and trade shows in the past few weeks to keep up with what's going on. The bottom line is that it is getting more difficult to identify and grasp all of the related issues about energy management in order to make the best decisions for building operations, remodeling, and daily operations. Nevertheless, energy management, done right, can reduce your operating expenses, improve your bottom line, enhance your budgeting, improve the quality of your buildings, and increase the value of your business through improved net operating income. But, achieving those results requires the services of professionals who know the ins and outs of the supply and the demand side of energy management, plus the financial principles that apply.

Take billings for electricity as an example. You may or may not realize there are two aspects to most electric bills. One is the demand charge; the other is the usage charge. Demand, measured in kilowatts or megawatts, is analogous to comparing a big car with a small one. The big one may go faster or carry more cargo; naturally, it costs more to buy than a small one that carries less or goes slower. This analogy is similar to running a building. The peak in electricity demand of your building over a season must be designed and provided by the utility delivery system, hence the demand charge. The larger vehicle actually may cost less to operate than the smaller one if it is driven on shorter trips or is parked more or carries more people on a given trip. That comparison is analogous to the usage charge on electric bills that is measured in kilowatt-hours (i.e. so many kilowatts per hour consumed over the billing period). To continue the auto analogy, there also is the cost of fuel to consider. By shopping around or negotiating long-term utility contracts, you may save money and improve the environment. The do-it-yourself approach may not be best for sorting out all the options to find the best combination – that could require a professional energy manager.

I asked Richard G. Lubinski, CEM, CDSM, CEMSC, president at Think Energy Management LLC of Silver Lake, OH, what a professional energy manager must know; here are some of his suggestions (paraphrased).

First, it is necessary to specify and design the energy-consuming systems in a building to achieve operational peak demand, but no more. This task means that energy managers must make some decisions based on the expected need for energy use as well as the functional aspects of the space – what architects may refer to as the “program” for the building. Internal environments must be optimized for maximum human productivity, and that includes comfort and security. In practice, energy-consuming systems usually are specified for a worst-case scenario, which means they often are over-designed with a higher demand factor than actually is experienced.

Then, there is the challenge of purchasing the energy, or the supply side of the equation. “Active” supply-side energy management can reduce your utility costs. Supply-side energy management can also reduce your business risk by accurately predicting your utility costs, thus improving your budgeting and your company's ability to price its products and services profitably. Energy supplies may come in different forms with different cost factors at different times. For example, you may be able to purchase electric power or fuel at off-peak rates if it can be stored or consumed when overall system demand is lower. If there are sufficient alternatives, you may be able to choose from electricity generated by coal, natural gas, nuclear, oil, or



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environmentally friendly sources including solar cells, wind generators, hydro-power, or possibly hydrogen sources in the future. About half of the U.S. states have adopted requirements for utility-renewable portfolio standards (RPSs), which include environmentally conscious options.

The other side of the energy-management equation includes demand factors. Obviously, the goal is to specify and install efficient energy-consuming products, as I have explained previously. This task involves the heating, ventilating, and air-conditioning (HVAC) systems, as well as lighting and plug-in operational equipment. Since equipment functions and product-efficiency factors are being improved constantly, the energy manager must know when it is appropriate to replace older, less-efficient products with the latest updates. Modern lighting, efficient boilers, variable air volume systems, and variable speed motors are a few examples. The availability of and competition for space in the local area must also be included in decision-making. Financial considerations that often are paramount in upgrade decisions include the net present value of money and anticipated future cash flows. If the project is not fundable, everyone loses. After installation, upgrades must be tested and verified to assure that performance meets expectations.

In addition, the human element must be factored in by energy managers. People come in all shapes and sizes, as well as all levels of energy intelligence. So, training, motivating, and controlling people to use energy most efficiently are parts of the energy-management challenge. If energy-consuming equipment is left on when it is unused, the consequences are obvious – or should be. Light switches, for example, come with an “off” position as well as an “on” position. But, people being people, it may be cost-effective to install some form of automated control system to assure that people will not be part of the problem instead of the solution. Building energy-automation systems range from simple lighting controls, based on occupancy sensors and adjustments for ambient daylight, to fully integrated computer-operated systems. At the top are systems that include seasonal climate conditions, time-of-day usage, and many other criteria that help assure energy efficiency for instantaneous operational decisions. Consumption may be reduced during times when energy is most expensive for the utility company to produce in exchange for billing credits. “Time-of-use” rates are becoming more popular since it is not just what you use – but when you use it – that makes the bottom line for the utility.

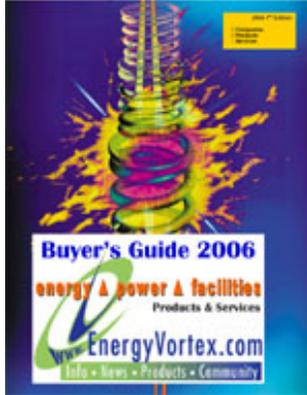
Getting the most from every dollar spent for energy requires people who keep up with the continuously changing technology and available hardware, as well as software, plus any federal tax incentives contained in the Energy Policy Act of 2005 (EPAct) that may apply. Some states provide additional rebates to help pay for part of your energy-efficiency projects, if they qualify. An independent energy expert could represent your interests in the energy-incentive programs available if professional staff is not available. Either way, energy management should be assigned to someone who has earned the credential of Certified Energy Manager (CEM). This international energy-professional certification is one of many among the full range of professional services provided by the Atlanta-based Association of Energy Engineers (AEE) ([www.aeecenter.org](http://www.aeecenter.org)). AEE is celebrating its 30th anniversary and has members in 77 countries around the world. Active participation in AEE will help assure that your energy professional is among the best in the business. It will also help to assure the integrity and commitment that is necessary to achieve your bottom-line success in the many growing challenges that just keep on coming in the complex (but exciting) developments in energy management.

About Lewis Tagliaferre  
 Lew formerly led the Electrical Contracting Foundation organizing team while serving the National Electrical Contractors Association (NECA) as Director of Marketing and Management Services in the '70s. He also served as acting executive director and managed several energy-related Foundation projects. After his retirement in 1998, he organized C-E-C Group as a proprietorship and has continued serving energy users and suppliers. He also completed a



Foundation project titled, "Surviving Utility Deregulation" in 1999 (<http://www.ecfound.org>). In addition, Lew has been published in over 180 articles in various trade magazines. He also consults with the Washington, D.C., chapter of NECA and supports its labor-management cooperation committee as an industry relations consultant. He completed engineering and business administration degrees, both with academic honors, and he has published three commercial books. He is a member of the Association of Energy Engineers.

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