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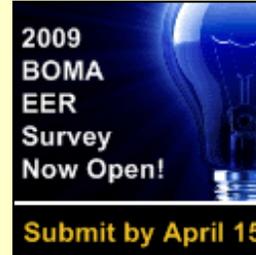
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Demand-Side Management: Now More than Ever

By Richard G. Lubinski

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While supply-side energy management is popular with many companies, the actual savings produced is relatively small, and temporary in nature. The other side of the coin is demand-side energy management, by which you can permanently reduce a building's cost by reducing its energy consumption. Demand-side management (DSM) pays for itself by generating utility savings, provides the owner with an attractive return on investment (ROI), and provides a positive net present value (NPV) as a pure investment. A bonus to the owner is how the improved cash flow of the building also contributes to asset appreciation by a multiplier of 10 or more. A DSM energy efficiency or control project that saves \$100,000 per year actually increases the value of the building by \$1 million. In very simple terms, this is why owners like energy management and, specifically, DSM projects.

At first glance, it may seem strange that utility companies not only support DSM projects, they also will help *pay* for them. It's in a utility company's best interest to reduce its electricity, natural gas, or water peak system load. This reduction in system load helps utility companies avoid or delay tens of millions (and, sometimes, billions) of dollars in capital improvements. To make DSM even more valuable as an investment to utility companies, you need to consider the poor ROI of building a new power plant for \$2 million, and only getting full use of it for a couple of weeks per year when their system is at a peak load. This same concept covers generation, transmission, and distribution systems.

In many states, the traditional utility-based DSM rebate programs have been shifted to the state energy offices. The utility companies are required to charge a kWh tax (additional fee) and send the funds to the state energy office. The state energy office then offers DSM rebates for lighting, HVAC, controls, renewable energy, and custom DSM programs. Some state energy offices also have low-interest loan programs to help property owners fund their DSM programs.

Surprisingly, there are little-known DSM rebate programs from some federal agencies, like the U.S. Department of Agriculture (USDA). The USDA has DSM rebates and low-interest loans programs for

rural businesses, farms, and agri-businesses.

An electric company in Florida invested \$230 million in DSM rebates that would appear to be a “gift” from the utility to its customers. This investment in DSM produced a 228 GWh consumption reduction, and, more importantly, a 117 MW summer load reduction, and 143 MW summer load reduction. The value of this load reduction was the avoidance or delay of about \$2 billion in capital investment in its system.

The Energy Policy Act of 2005 (EPA) included tax incentives for DSM projects that outperformed the minimum energy code, such as *ASHRAE 90.1-2001*. In a nutshell, you can take advantage of the “immediate expense election” under *IRS Code 179D* if your energy-efficiency project exceeded the energy code standards by certain percentages. While not covered in this article, the EPA could be worth as much as \$1.60 per square foot for your building. Lighting retrofits are the most popular EPA task target in part because the IRS provided “interim rules” on the method to justify the section *179D* claim. The EPA permits a licensed contractor or tax professional to prepare the engineering study to back up your one-line section *179D* (immediate expense election – other). Consider using a tax professional (a CPA or a tax attorney) who also employs energy engineers to run the calculations. There are a few CPA firms in the United States that employ engineers specifically to help their clients with EPA tax. The tax incentives under the EPA were recently extended through 2013.

ECMs

The goal of an energy audit is to identify cost-effective energy-conservation measures (ECMs). Some ECMs are self-described as low-/no-cost ECMs. These are intended to reduce energy consumption by better use of existing automatic or manual controls. Smarter temperature control over boilers, chillers, and domestic water-heating systems can reduce energy costs with no capital investment. Smarter control over lighting by employees, cleaning crews, and security is a no-cost ECM, but it requires management oversight for long-term success. Traditional retrocommissioning studies are directed toward this end. Unfortunately, some firms are offering retrocommissioning studies for \$20,000 that are actually a Level 1 energy audit. These so-called retrocommissioning studies include a recommendation for a (real) retrocommissioning study for an additional \$60,000 or \$80,000.

The next tier of ECMs requires some capital investment, but offers an attractive ROI. This is the most common category for ECMs that can be supported by utility- or state-based DSM rebate programs. DSM rebates exist in straightforward energy-conservation measures with clearly defined rules commonly called “prescriptive” DSM rebates. Examples of prescriptive ECMs for DSM rebate include proven energy-savings improvements, such as lighting and HVAC retrofits, CO₂-based outside air-ventilation control, and use of variable frequency drives for motors, high-efficiency motors, and other high-efficiency equipment. The second DSM rebate category is called “custom.” As the name implies this permits the agency running the program to come up with creative or custom DSMs rebate for innovative ECMs. These custom DSM rebates are also based on actual energy savings and can be called “pay for performance.” The custom DSM rebate may pay \$0.10 per kWh saved based on a combination of utility records or metering associated the custom ECMs. Some of these custom DSM rebates require independent documentation of the energy savings by a certified energy manager (CEM) or registered professional engineer (PE). There are also special DSM rebates for non-profits, educational institutions, and some government buildings.

Where to Find DSM Rebates

To find out if your area has a DSM rebate program, visit the federal government Database of State Incentives for Renewables Energy ([DSIRE](#)). Some states and utility companies do not have DSM rebate programs; others say they have DSM programs and energy-efficiency programs, but what they actually have are little more than public-relations programs. And, some states' and utilities' so-called

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energy-efficiency programs are worse yet: All they offer people who are serious about energy conservation are a few generic brochures on energy topics. New York has one of the best DSM programs in the United States, which can be found at www.nyserda.com. California has so many DSM rebate programs that it takes 13 pages just to list them. While the names of the offices vary, every state has an agency in charge of energy and environmental topics.



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Depending on the DSM program, it may help with the first major step in the energy-management journey: the energy audit. Some programs offer free energy audits. Consider yourself warned, though – they may be worth what you pay for them. Other DSM programs will pay for 50 percent of the cost of a professional energy audit, while some rebates require you to use an energy engineer selected by the state or the utility company. Some forward-thinking DSM programs will pay for 50 percent of the energy audit and later pay for the other 50 percent – *if* you implement 80 percent of the ECMs that the audit recommends; therefore, it's possible to get a professional energy audit done and, ultimately, get it without cost.

Be wary of "free energy audits" since everyone knows that nothing is free. A window company that performs a free energy audit will recommend that you purchase windows, and the vendor may provide an unrealistic payback-period analysis. A lighting contractor might offer a free energy audit; expect the report to recommend a lighting retrofit. It's surprising to some people that the free energy audit always results in a *recommendation to buy the only thing this vendor sells*. You need to hire a professional energy engineering firm to get independent advice that's free from all conflicts of interest connected to any product or service.

Taking Action

As the famous Chinese proverb goes, "A trip of 10,000 miles starts with a single step." The obvious advice to start moving your organization toward lower energy costs and a better bottom line is to start your investigation into your buildings' energy-management opportunities.

Collecting operating costs and energy-consumption data, and then obtaining senior management's support, is a just the beginning.

Benchmarking data, comparing your building's BTUs per square foot, is another excellent tool.

Focus on ECMs that offer attractive ROI when applied specifically to your building. If you focus on ROI, then you ultimately end up with a greener building. Common sense, combined with solid independent energy engineering advice, should help you identify DSM opportunities in most buildings. Start with the low-/no-cost ECMs, and strive for a long-term commitment to energy-management success. The good news is that you can track the energy-consumption data and compare it to the same period from the prior year. In this way, you keep the process focused on bottom-line results. While you can't control rising utility rates and energy-commodity costs, you *can* address the underlining energy-consumption numbers.

With tougher economic times, controlling energy consumption is more important now than ever before. The results from your low-/no-cost ECMs will lead to ECMs that require capital investments, but offer attractive ROI. This process then leads to proper energy engineering of the major capital investment decisions when capital budgets are not quite as tight. If DSM improvements are done correctly, they represent *permanent* utility savings for your building. Your senior management, and the building owner, will appreciate the results, and recognize your role in making it happen.



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