

Energy management overload  
 by Charles Redell - 2.1.10

People still talk about the day in June 1979 when President Jimmy Carter unveiled a solar hot water system on the roof of the White House. Before President Ronald Reagan took the panels down, some even referred to it as the day “the solar age” was born.

Yet few talk about the energy-efficient retrofits that have been taking place at the White House for more than a decade, including a 2009 announcement that the White House would be retrofitted to meet the requirements of the [U.S. Green Building Council's](#) Leadership in Energy and Environmental Design Existing Building (LEED-EB) certification.

“We have not done a very good job of promoting the industry,” says Donald Gilligan, president of [National Association of Energy Service Companies](#) (NAESCO). “Not so many people are excited by going down to the basement and insulating pipes.”

Energy management—or decisions made on the customer side of a meter about how much electricity is used—has been called “the hidden sector of the energy business.”

That’s primed to change in coming years, according to Gilligan. The biggest winners will be the ones willing to make an investment now—while stimulus funding and tax credits are available and before energy prices soar even further and climate change legislation mandates it.

Before the energy management sector can really take off, however, many issues need to be addressed, including how to finance capital-intensive projects, create incentive models that work for all stakeholders and train a new work force.

### Opportunity knocks

Over the next five years, the energy management services sector in North America could see its revenues double to more than \$40 billion, according to a study released in November 2008 by Frost & Sullivan, a research consultancy focused on new growth opportunities, thanks to potential climate change legislation, rising energy costs, stimulus spending and proposed mandates to perform energy efficiency upgrades on existing buildings. A November 2009 study by Pike Research, a cleantech market research firm based in Boulder, Colo., says cumulative investment in energy management systems could rise to almost \$68 billion by 2020.

President Obama has even taken to calling energy management “sexy.” At a recent press event staged at a Home Depot (NYSE: HD) store in Virginia, he said, “Here’s what’s sexy about it: saving money.”

A \$50 billion per-year investment over 10 years in energy upgrades of buildings could reduce the nation’s energy consumption by 23 percent by 2020, save the U.S. economy \$1.2 trillion and reduce greenhouse gas emissions by 1.1 gigatons annually, according to a study released in July 2009 by McKinsey & Company.

Where that \$50 billion per year will come from is a huge question.

Without a doubt, the biggest investor in energy management right now is the federal government. Solid numbers for federal investment and spending on energy management are difficult to calculate, but the [American Recovery and Reinvestment Act](#) (ARRA) allocated \$36.7 billion to Department of Energy, which dedicated almost \$17 billion to spending on energy efficiency and renewable energy. It also set aside \$11 billion for investment in state and local government efficiency programs.



At IBM, how air moves informs designs of data centers.



This IBM building was built in the mid-1960s when energy was cheap.

All that investment (plus as much as \$20 billion in federal tax credits for energy efficiency) has “reinforced the fact that efficiency is the answer to this whole perfect storm of challenges that we have around greenhouse gas emissions, climate change and around this whole green economy,” says Bruno Biasiotta, vice president and general manager for Johnson Controls’ (NYSE: JCI) Energy Solutions Business for the Americas.

But the stimulus act hasn’t yet had as much of an effect on the bottom lines of energy management services companies, decreasing U.S. energy use in buildings, reducing carbon emissions or creating jobs, according to many in the industry. Out of the \$11 billion dedicated to state grants for energy efficiency, less than \$500 million has been spent, according to Recovery.gov, the government’s Web site dedicated to tracking stimulus spending. (Much of the remainder has to be awarded by the end of 1Q 2010 and [spent within a year](#).) Furthermore, the long-term effects of energy management—decreased reliance on foreign sources of power, reduced greenhouse gas emissions, reduced energy costs, job creation—might not be felt for years.

### A MUSHy market

Eighty percent of the \$6 billion in revenues expected to have been earned by energy services companies (ESCOs) in 2009 came from government projects, according to NAESCO. Sixty percent are municipal, university, schools and hospitals (otherwise known as the MUSH market). So how do ESCOs tap into the commercial and industrial sectors?

For Charlie Bacon, CEO of [Limbach Facility Services](#), based in Pittsburgh, the MUSH market has been the base for his \$300 million company for 16 years. But as the recession draws to a close and companies look to start growing over the next six to nine months, Bacon says he is focused on cracking the owner-occupied market. “Facilities are going to become a part of that discussion,” he says. “It’s going to become economic.”

Leased office buildings are not as lucrative a market for ESCOs, yet. Typically, tenants of large commercial buildings are responsible for utility bills, but not for building systems and envelopes. This creates what is known as a split incentive. The owners don’t want to invest in upgrades that would decrease utility bills paid by building tenants. On the other side, tenants often refuse to invest in equipment they don’t own.

Different methods of solving this problem are being proposed around the country. In New York City, Mayor Michael Bloomberg in December tried to pass legislation requiring owners of buildings larger than 50,000 square feet to perform energy audits every 10 years and then make upgrades to improve building performance. Only the audit piece of the bill passed, in large part because the perceived costs of capital upgrades are not popular, says Gilligan.

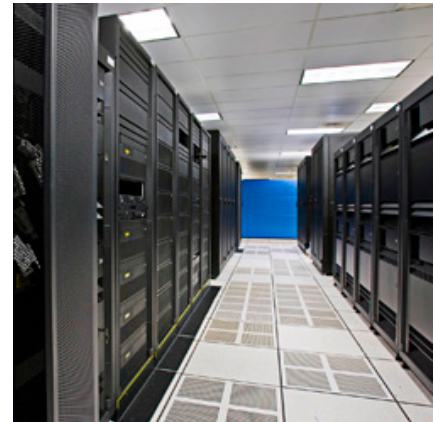
Another model being explored is already in place for the residential market in certain areas. So-called Property Assessed Clean Energy (PACE) bonds would tie loan payments for energy-related upgrades to utility bills or property taxes. The idea is one that energy service companies such as Johnson Controls are getting behind. “We need to solve the question around length of time and what that means in terms of return on investment and who really gets those benefits,” says Johnson Controls’ Biasiotta. “That’s why this whole PACE model makes sense and is scalable.”

Property owners aren’t so sure, though. Seattle-based Unico Properties in December 2009 announced that it is now the manager of the city’s largest portfolio of buildings that meet LEED-EB certification (see “Unico portfolio goes LEED-EB in a big way, p. 24). The company plans to earn certification for 78 percent of its entire 10 million-square foot portfolio around the West by the end of 2010.

“We are focused on the fact that it is the right thing to do, and that decreasing the expenses increases the net operating income and increases the value immediately...” says Margot Crosman, Unico’s director of sustainability. However, she adds, “Owners hate to ‘encumber’ their properties with any kind of long-term deal.”

Similarly, industrial customers are simply not interested in the long-term payback periods associated with building retrofits and capital investments in new equipment, Gilligan says. Managers and owners of such facilities typically look for payback periods of one to two years while ESCOs tend to offer payback periods of 10 to 15 years.

Such scenarios led to the creation of Energy Performance Service Contracts (EPSCOs), which allow a building owner to pay for capital upgrades out of actual savings on energy bills over a number of years. And thanks to the performance guarantees



New IBM "Green" data center and facilities in Boulder, CO.

inherent in EPSCOs, accurate reporting comes as a part of the package—a boon in an era of government accountability.

### **Tools of the trade**

As the energy management sector grows, businesses other than ESCOs are set to benefit. From “smart” HVAC systems to lighting retrofits to energy-efficient appliances, about 60 percent of the energy management market share is going to hardware manufacturers, according to Sivapriya Ramakrishnan, a research analyst for Mountain View, Calif.–based research company Frost and Sullivan. “Interactive energy management platforms are also witnessing increasing popularity,” Ramakrishnan says.

Global technology companies such as IBM (NYSE: IBM), which owns a lot of properties around the world and has a goal to reduce its greenhouse gas emissions by 12 percent by 2012, are incorporating building energy management into their portfolios.

Data centers and manufacturing make up a large part of IBM’s portfolio and provide the biggest returns on investment, according to Jay Dietrich, Climate Stewardship Program manager at IBM. “Historically, the IT teams ran the data center, and facilities ran the support outside the walls, and there wasn’t a lot of communication in between,” he says. Integrating information from the two groups typically yields energy savings of about 10 percent, Dietrich says.

The company has also created maps of data center layouts and airflows to learn what setup requires the least amount of energy. These efforts in turn help it recover energy in existing buildings, which Dietrich says allows IBM to add business even where energy constraints would normally restrict such growth. The company is also better at planning new data centers now, he says. IBM also works to find low-cost opportunities in its commercial buildings. Combined, the two initiatives accounted for \$343 million in energy savings between 1990 and 2008, according to Dietrich.

### **Job creation**

From most accounts, investment in energy management services is already creating new jobs. A \$2 million energy efficiency construction-related project can create as many as 50 jobs, according to a white paper released by Johnson Controls. And a \$10 million EPSCO might account for 95 jobs, according to NAESCO. Finally, energy efficiency programs included in climate change legislation being debated by the Senate could create as many as 20,000 jobs by 2020, according to American Council for an Energy-Efficient Economy.

At Lane County Community College in Oregon, Roger Ebbage, director of energy and water programs, is hard at work training this new work force. The school is home to the Northwest Energy Education Institute, which has been training the front-line workers of the energy management services industry since 1980. Enrollment in this once-sleepy program tripled over the last two years to 90 and closed for the 2010-2011 academic year by December, says Ebbage.

The government funding that is currently flowing toward home weatherization for low-income families is creating a demand for a work force that can audit buildings and install the hardware. Money for upgrades to government, commercial and industrial structures also requires people who can interpret the data and interact with the technology that controls building systems.

The first two lessons are ones that Ebbage is able to impart, he says. The last one though, is proving to be harder to pass on to his students.

“The complexity is in how these buildings are controlled,” says Ebbage. New computer-controlled building systems have interfaces that are meant to be user friendly and intuitive, but that doesn’t make it easier for the people who are going to be running them in the future, according to Ebbage. “We have an old guard that doesn’t care how easy it is to interface with these controls,” he says. “They are not interested. And then we have this new group ... the problem that we have, they get this computer stuff. What they don’t get is the building systems. They don’t get what it is that they are controlling.”

For all the hurdles and stumbling blocks that exist in the energy management industry, leaders of the sector say that achieving its goals is possible. It’s going to take continual leadership from large energy users, including government, commercial and industrial building owners. And it’s going to take some changes to both how people use energy and how codes and energy policies are updated—and how they are enforced.

“There’s a big issue about implementation,” says NAESCO’s Gilligan. “Our approach so far has been voluntary. My sense is that we have to say that we’ve given it a really good shot. And now we have to do something else.”


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