

by Danielle Miller Wagner

Using Energy Efficiency to Create A More Sustainable Bottom Line

In May 2007, ICMA conducted an informal survey of its members to determine what local governments are doing to address the issue of climate change. The survey included a number of questions about energy efficiency, the most telling of which was that 82 percent of respondents expressed a need for information on increasing energy efficiency in local government buildings. In response to this request for information, ICMA researched energy efficiency practices in a number of local governments.

The built environment—commercial, industrial, and residential buildings—is responsible for 48 percent of all energy consumption and greenhouse gas emissions, according to data from the U.S. Energy Information Administration and Architecture 2030, a nonprofit organization founded to respond to global warming. An obvious starting point for local governments' energy efficiency efforts is their own buildings. In most cases, these buildings include office buildings and police and fire stations. In some cases, the local government also has responsibility for schools and locally owned utilities.

THREE STEPS

Reducing energy consumption is a three-step process. Step one strives to reduce energy use through such no-cost changes as reprogramming sleep modes on computers, setting policies for employees to turn off computers and lights at the end of

each workday, and operating heating and cooling systems to run more efficiently.

The second step picks off the low-hanging fruit that require only limited investment and that can usually be completed by facilities staff. These include changing from incandescent to high-efficiency lightbulbs in all facilities, street lighting, and traffic lights; using sensors to activate lighting; and upgrading leaky windows to double-paneled energy efficient models.

Step three requires investments such as replacing HVAC equipment with high-efficiency equipment and establishing green roofs. Finally, if local objectives include not only saving money and reducing energy demand but also reducing greenhouse gas emissions, then managers also pursue the important fourth step of meeting remaining energy needs through renewable energy to the maximum extent possible.

There is a range of building standards to which existing buildings can be retrofitted as well as standards for new buildings. The best-known standard for "green" buildings is the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED). The U.S. Environmental Protection Agency's (EPA) ENERGY STAR program offers a national energy performance rating system, which is based on actual energy consumption of a particular building as compared with other comparable building types. The Green Building Initiative (GBI), also known as Green Globes, offers its own green building label and is pilot testing a new standard for existing commercial buildings.

Each program of building standards has different programmatic criteria, and in some cases not all of the criteria are specifically designed to achieve energy savings. With this in mind, it might be necessary to pick and choose the elements most closely aligned with your locality's energy-saving goals. In addition to the guidance, direction, and, in some cases,

technical assistance to achieve energy savings, another welcome by-product of the rating systems is the recognition that comes with being able to publicly proclaim that a building meets certain recognized standards.

CHARLOTTESVILLE, VIRGINIA

As the home of the University of Virginia, the city of Charlottesville, Virginia, has long been known for both history and innovation. An independent city in the center of Virginia, Charlottesville has a population of just more than 40,000. According to City

needs of all city departments. Environmental administration has responsibilities for compliance and for coordinating and supporting within city departments such environmental initiatives as alternative fuels, storm-water management, and urban forest management.

In 2003, the city started developing an environmental management system (EMS) with support from the U.S. Environmental Protection Agency and the Global Environment and Technology Foundation. An EMS is a continual cycle of planning, implementing, reviewing, and improving the processes and activities that an organization undertakes to meet its business and environmental goals.

Implementation of the EMS has been ongoing. The department of parks and recreation was the first department to engage in the EMS process in 2003 and is continuing to refine its EMS. In 2005, the fleet division of the department of public works began to engage in an EMS process; the department's transit division, public service division, and gas utility soon followed. According to O'Connell, the EMS system has resulted in significant energy and cost savings.

Following Mayor David Brown's signing in 2006 of the Climate Protection Agreement under the auspices of the U.S. Conference of Mayors, Charlottesville committed to reduce future greenhouse gas emissions from local facilities. In addition to municipal buildings, Charlottesville's facilities maintenance division is also responsible for maintenance and energy management services for the Charlottesville school system. The division, with support from the city manager and the school board, therefore launched an aggressive school energy conservation campaign.

In this effort, Charlottesville launched a cash incentive program to encourage individual schools to reduce energy consumption. Baseline quarterly consumption and spending goals were established for each

WHAT SOME MEMBERS THINK ABOUT CLIMATE CHANGE

81%

believe that local government managers should address the issue of climate change.

81%

would like information on energy efficiency in local government buildings.

71%

are involved in activities to address the impacts of local government operations on climate change.

Source: Responses to ICMA's May 2007 informal survey of its members to assess ongoing climate change prevention and awareness activities, which include such things as energy efficiency and conservation, alternative vehicles and alternative fuels, and solid waste reduction.

Manager Gary O'Connell, "Our city is working towards our vision of being a green city in many and varied ways. We are working on new approaches to emphasize a change in our city's thinking about the impacts we have on the environment that surrounds us."

In 2002, Charlottesville established an environmental administration division within its public works department to support the environmental

ENERGY STAR

ICMA is pleased to help local governments take advantage of the Environmental Protection Agency's (EPA) ENERGY STAR program. Through ENERGY STAR, EPA provides local governments with a proven energy management strategy and no-cost tools to save energy and money, as well as demonstrate your environmental leadership.

Local governments can sign up to join the ENERGY STAR Challenge, a national call to action to improve the energy efficiency of America's commercial and industrial buildings by 10 percent or more. Local governments play a vital dual role in helping meet the goals of the ENERGY STAR Challenge. They lead by example by improving their own buildings, and they leverage relationships with private sector organizations to motivate these groups to do the same.

The "Challenge Toolkit" includes a menu of cost-free technical management and financial support tools, along with co-brandable ENERGY STAR brochures, public service announcements, press releases, posters, event ideas, and templates to help spread the word about energy efficiency. Sign up and learn more at www.energystar.gov/challenge.

school on the basis of historical trends and seasonal cycles. If a given school beats that goal, the city promises to cut a check to that school for half of the savings. The school will then be able to use that funding to further its education programs, and the city has committed to using its share of the cost savings to improve the energy efficiency of school buildings.

Each month the most efficient school is awarded \$100 and a trophy. During the first year of the program, consumption of electricity was down 10 percent and natural gas consumption was down by 31 percent compared with the previous year, resulting in estimated reductions of 2,120,127 pounds of carbon dioxide. To the delight of school principals, the city disbursed \$45,337 on the basis of actual cost savings.

Furthering its already serious commitment to energy efficiency, the city worked closely with an energy services company (also called an ESCO) to undertake an energy audit of its 11 most energy-intensive buildings, and it is now implementing many of the audit's recommendations, which are valued at approximately \$1.3 million. Lance Stewart, facilities maintenance manager, and 29 maintenance staff members determined

which of the ESCO's recommendations could be implemented internally and issued a contract for the contractor to complete the remaining work, including lighting fixture replacements, lighting system upgrades, water fixture improvements, HVAC system improvements to electronic controls, and retrocommissioning HVAC equipment and controls.

A second phase energy audit

The potential for financial savings through energy efficiency is significant, and up-front capital investments often can be financed through future energy savings.

and energy efficiency retrofitting is scheduled to begin in late summer 2007, with 25 buildings and all traffic signals slated for evaluation and improvement.

Through its ongoing EMS and commitment to energy efficiency, the city's energy bills have decreased by \$293,745 from FY 2006 to FY 2007.

After the implementation of both phases of energy audit recommendations, Stewart expects to more than triple the city's annual energy savings.

ARLINGTON COUNTY, VIRGINIA

Arlington County, in northern Virginia just west of Washington, D.C., has also taken a leadership role in energy efficiency, both by reducing energy consumption within county facilities and also by providing incentives to residents and businesses to limit their energy use.

Arlington's signature program, Arlington Initiative to Reduce Emissions (AIRE), aims to reduce the county government's greenhouse gas emissions by 10 percent between 2000 and 2012. This effort is led by an interdepartmental team coordinated by the county's energy manager.

Specific actions under way include increasing investments in energy efficient building retrofits, doubling the county's wind power purchase to 6 percent from the current 3 percent in 2007, installing solar panels in select county facilities, requiring major public buildings to achieve a LEED certification, renewing the focus on recycling in public buildings, and County Manager Ron Carlee's policy mandating the replacement of incandescent light bulbs with compact fluorescents or other higher-efficiency lighting within all county facilities by the end of 2007.

Beyond county facilities, Arlington is partnering with the ENERGY STAR program to provide guidance, support, and resources for local businesses to consume less energy. Arlington County's commercial buildings stock accounts for more than 40 percent of the county's total greenhouse gas emissions, and with steadily increasing utility prices, the potential savings and environmental impacts are enormous for these important stakeholders. In addition, the county passed a personal property tax exemption on the first \$20,000 value of certain fuel-efficient and alternative-fuel vehicles, primarily hybrid-electrics.

ICMA's Sustainability Initiative

ICMA's Sustainable Communities Leadership Initiative is a comprehensive series of programs and resources designed to help local government managers chart an environmentally, economically, and socially sustainable course for their communities. This article is one of many informational resources and technical tools available through the initiative. For more information, visit icma.org/sustainability.

A key funding source designed to enhance Arlington's efforts is the initiation of a residential energy tax. In the wake of utility deregulation, many states mandated "public benefits charges" collected as small fees on all electricity use; these fees are then used for energy efficiency, renewable energy, and low-income assistance programs through state or nongovernmental programs. Virginia does not have such a program, so Arlington's new, small residential energy tax is similar to a public benefits charge, wherein the county is providing the community with energy efficiency programming that will focus on outreach about energy efficiency and renewable energy as well as assistance to low-income and fixed-income residents.

According to Energy Manager John Morrill, "the tax is based on a sliding scale of energy use with no tax on monthly consumption of up to 400 kilowatt-hours (kWh) and 20 therms, so homes using the best energy efficiency practices will not pay any energy taxes in many months."

During the past 10 years, the county has avoided more than \$4 million in energy costs. This began with Arlington County's replacement of mercury vapor streetlights with high-pressure sodium streetlights, and it includes replacing incandescent traffic signals with LED signals, increasing efficiency in buildings, and using high-efficiency vehicles in its fleet.

Through FY 2006, the annual savings from efficiency investments and practices has totaled 7 million kWh of electricity, 100,000 therms of natural gas, and 15,000 gallons of gasoline each year, which represent, respectively, 9 percent, 10 percent, and 2 percent of current total consumption.

The avoided cost value of these savings is more than \$600,000 per year at current energy prices, with additional savings in maintenance costs from certain efficiency investments, according to Energy Manager Morrill.

"Because of our investments in energy efficiency technologies and management practices, we have been able to grow local government facilities and service delivery at a steady pace

The process used by New Castle as well as Charlottesville and Arlington is called energy savings performance contracting, and it is a growing contractual mechanism for organizations seeking to reduce energy consumption.

while keeping energy use level and, in some years, declining. This has meant stable budgets for the county and a very supportive community," says County Manager Carlee.

NEW CASTLE COUNTY, DELAWARE

New Castle County is an environmental pioneer in the state of Delaware. The county was an early adopter of local government sustainability practices, starting with waste reduction and increased recycling, which empowered staff to take leadership positions

on environmental initiatives. More than a year ago, the county decided to take its sustainability commitment to the next level and tackle one of its largest sources of emissions: county buildings and facilities.

New Castle County engaged in a competitive bid process to find a company that could help it realize energy reductions and cost savings. The county contracted with Ameresco, an ESCO specializing in energy efficiency and renewable energy project development, to evaluate and implement conservation measures in all county facilities. ESCO's role is to evaluate all aspects of county facilities and devise strategies for reducing demand and costs.

The process used by New Castle as well as Charlottesville and Arlington is called energy savings performance contracting, and it is a growing contractual mechanism for organizations seeking to reduce energy consumption in a timely fashion without the need for up-front capital. This process uses the savings from efficiency upgrades to finance the actual facility improvements, including capital expenses. Performance contracting can be described as a "pay it forward" system, with the reduced energy costs paying for the investments over time and in many cases leaving the facility owner with excess savings to put to use elsewhere.

The first challenge for the county was to conduct an audit of the facility it shares with the Wilmington city government, as several systems were quite old and threatening to fail. The comprehensive audit of the Redding City/County Building, which houses more than 420 employees, identified multiple opportunities to reduce energy and water demand and costs, including upgrades to the lighting, energy management, and water systems and replacement of the mechanical systems. Total project costs are \$3.46 million, and guaranteed annual energy savings are \$355,000 over 15 years.

New Castle County has been pleased with its initial efforts and has

Web Resources

For detailed information on the information in this article, visit these Web sites:

Charlottesville, Virginia, Public Works, www.charlottesville.org/publicworks
Arlington County, Virginia, AIRE, www.arlingtonva.us/climate
New Castle County, Delaware, environmental initiatives, www.co.new-castle.de.us/executive/home/webpage14.asp
ENERGY STAR, www.energystar.gov
U.S. Green Building Council, www.usgbc.org
Green Building Initiative, www.thegbi.org
Johnson Controls, Performance Contracting, www.johnsoncontrols.com/publish/us/en/products/building_efficiency/capabilities/performance_contracting.html
International Council for Local Environmental Initiatives—Local Governments for Sustainability, www.iclei.org

now expanded its green initiatives to take a more holistic look at county emissions. New Castle County has signed on with ICLEI (International Council for Local Environmental Initiatives—Local Governments for Sustainability) to conduct a comprehensive inventory of greenhouse

gas emissions to better track overall emissions reductions. The county also will open a new LEED-certified public safety building in summer 2007, and it has enacted a resolution requiring that all new county facilities are as green and as energy efficient as possible.

According to County Executive Chris Coons, “New Castle County is being aggressive about reducing its impact on the environment. Through our leadership, we hope to set an example for businesses, residents, and other local communities on the earth-friendly and economic benefits of reducing emissions and energy demand.”

THE POSSIBILITIES

The potential for financial savings through energy efficiency is significant, and up-front capital investments often can be financed through future energy savings. Thus, even small local governments or those without significant energy budgets can take advantage of emerging performance contracting practices to reduce energy consumption, energy costs, and greenhouse gas emissions. **PM**

Danielle Miller Wagner is a program director, Results Networks team, ICMA, Washington, D.C. (dmwagner@icma.org).

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