Green Government

An initiative of the National Association of Counties

Counties & Commercial Green Buildings

Introduction

By leading efforts to develop services, incentives, programs and policies, counties across the nation are helping deliver the proven environmental and economic benefits of green building to their communities. According to a joint study conducted by the National Association of Counties (NACo) and the American Institute of Architects (AIA), at least 25% of people living in the country's 200 most populous counties live in a county with a green building program. The study found that green programs have increased by 400% over the last three years.

The U.S. Department of Energy (DOE) defines commercial buildings as "those designed, built and operated for any use other than residential, manufacturing, or agriculture, including everything from schools to hospitals, offices to grocery stores." Commercial buildings affect the environment, economy, health and even worker productivity. According to ENERGY STAR®, a program sponsored by the US Environmental Protection Agency (USEPA), commercial buildings account for 18% of total U.S. energy consumption and contribute an estimated 15% of U.S. greenhouse gas emissions.

Johnson County, KS Sunset Office Building

About Green Buildings

The U.S. Green Building Council (USGBC) reports that green building involves the maximization of the building's and site's efficiency in using, generating and recycling energy, water and materials, as well as the minimization of the impact of buildings on health and the environment. This includes both the construction of new buildings and the renovation, operation and maintenance of existing buildings. Aspects of green commercial buildings may include:

- a site selected to take advantage of mass transit, protect the existing landscape and minimize the disruption of natural elements, taking into account soil, the use of native plants for landscaping elements and existing infrastructure (for more information, see the section on "Protecting the Existing Environment" on page 3);
- the use of sustainable materials, which may be biobased, made from recycled materials, or reused from other buildings (for more information, see the "Green Materials" section on page 5);
- the use of cleaner fuels to power construction equipment and minimization of emissions through the use of retrofitted vehicles and equipment;
- the use of ENERGY STAR-labeled appliances, which are more energy efficient than other products on the market (for more information, visit *www.energystar.gov*);
- properly sized heating, ventilation and air-conditioning (HVAC) systems, which moderate temperature in the building more efficiently (for more information on selecting right-sized appliances, visit *www.energystar.gov.*);
- high water efficiency, including the use of "grey" recycled water for toilet flushing and site irrigation, the installation of ultra low-flush toilets and the collection of rainwater for use in landscaping irrigation (for more information on water conservation and efficiency, visit *www.epa.gov/OW/index.html*);
- better indoor air quality, including dedicated ventilation systems, separate exhaust systems in areas with high pollution sources, the regulation of ventilation air quantities based on occupation needs, a no-smoking policy, high-efficiency filtration and use of interior finish materials with low amounts or no volatile organic chemicals (VOCs) (for more information on indoor air quality, visit *www.epa.gov/ebtpages/airindoorairpollution.html*); and
- better lighting efficiency, which may include using daylight, more efficient light bulbs or new lighting technology (for more information, see NACo's Green Government Initiative fact sheet, "Energy Efficient Lighting in County Facilities," located at *www.greencounties.org.*).

Benefits of Commercial Green Buildings

Properly designed, constructed and operated green buildings can have significant health, economic and environmental benefits. This occurs through decreased energy use, improved ventilation and lighting, a reduction in the use of fossil fuels and decrease in the amount of associated greenhouse gases released into the atmosphere, enhanced community education and an increased understanding, availability and uptake of green building technology.

Financial Benefits

Green buildings are designed to be more energy- and water-efficient than traditional buildings, also yielding savings in these areas. According to studies conducted by the USGBC, investing an average premium of 2% to build green can result in an average lifecycle savings of 20% of the total construction costs for the building – more than ten times the initial investment. An investment of $4 per square foot can yield an average of a $58 benefit over 20 years. In addition, "The

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County Case Study:

Clark County, Nevada
Population: 1,710,551
County Seat: Las Vegas

Clark County, Nevada's Government Center was built to minimize the use of non-renewable sources and have as little impact on the environment as possible. It is designed to be highly energy efficient, with 6 inch fiberglass insulation, a tapered and insulated roof and dual-pane, highly reflective windows to minimize the amount of air-conditioning and heating that is necessary to moderate the building's temperature. When temperature moderation is necessary, the building uses high-efficiency equipment. Additionally, the Government Center was constructed with materials such as carpet, carpet glue, paint, sealants, adhesives and furniture with low toxin emissions to improve indoor air quality.

In December of 2007, Clark County launched its Eco-County Initiative. The initiative promotes the conservation of natural resources, demonstrations of green projects and a study of the impact of county facilities on the environment. Specific goals have been set, including a 20% reduction of energy purchases by 2015 and an 80% reduction of global warming emissions by 2050.

Cost of Green Revisited," a study conducted by international cost-management firm Davis Langdon, showed that "there is no significant difference in average costs for green buildings as compared to non-green buildings." The report continued, "Many project teams are building green buildings with little or no added cost and with budgets well within the cost range of non-green buildings with similar programs." To see the complete Davis Langdon study, visit *www.davislangdon.com/USA/Research/ResearchFinder/2007-The-Cost-of-Green-Revisited/*.

Energy efficient designs and systems can result in lifecycle cost savings over an extended period of time. It is often typical for developers to maintain ownership of a building for a period of 5-7 years. Depending on the upfront costs, the developer may not be able to recoup the initial investment of an energy efficient design or system without significant incentives.

Health Benefits

People spend approximately 90% of their time indoors, according to the USEPA. The California Air Resources Board estimates that indoor air pollutant levels are 25-62% greater than outside levels and can pose serious health problems. The USEPA reports that several illnesses, including Legionnaire's disease, asthma, hypersensitivity pneumonitis and humidifier fever, can be shown to be caused by construction-related problems and lists the following three major sources of indoor air pollution:

- the presence of pollution sources, such as organics found in carpets, formaldehyde, or paint;
- poorly designed, maintained, or operated ventilation systems; and
- unanticipated or badly planned uses of the building.

Green buildings take these potential hazards into account by focusing on improved indoor air quality. More specifically, by providing improved ventilation, using materials with lower levels of toxins and more effective building planning.

Productivity Benefits

By providing better indoor environmental quality, employees can benefit from greater physical comfort and higher productivity. A 2003 study conducted by Carnegie Mellon University Professor Vivian Loftness found that some features of green buildings can increase the productivity of workers. The study reported a productivity gain of 3% to 18% in facilities using daylight, 0.4% to 7.5% in facilities with natural ventilation and outdoor access and a 0.2% to 3% gain in facilities with individual temperature controls. To see the complete study, visit *www.aia.org/SiteObjects/files/BIDS_color.pdf*.

Environmental Benefits

Green buildings save 30-50% in energy, 35% in carbon, 40% in water and 70% in waste, according to the USGBC. Due to water-efficient fixtures and well-planned landscaping, green buildings use the minimum possible amount of water, leaving ecosystems and reservoirs intact and reducing strain on local water infrastructure, as well as reducing the use of fossil fuels associated with water treatment. These buildings also use fewer fossil fuels through increased energy efficiency and use of renewable energy, thus reducing emissions of carbon dioxide and other greenhouse gases. Additionally, green buildings produce smaller amounts of waste, which puts less stress on local landfills. They are designed to be integrated within the existing environment, disturb soil and plant and animal life as little as possible and cause less harm to nearby ecosystems than traditional buildings.

Community Benefits

Green county buildings can set an example for residents and local businesses, demonstrating to them the effectiveness of these facilities. Additionally, green building can preserve local quality of life by reducing air pollution and increasing the value of nearby land, as well as increase employee health by encouraging workers to walk or bike to work and be more active.

Ada County, ID Courthouse and Administration Building

The reclamation and repurposing of brownfield sites for new construction also has great potential for communities with abandoned industrial areas. The USEPA defines brownfields as "real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant." Turning these lands into centers of commerce or industry and creating jobs through their cleanup can positively impact the local economy and quality of life. For more information on brownfields, visit *www.epa.gov/brownfields/basic_info.htm*.

Get Started: Greening County Buildings

The USGBC, ENERGY STAR and the Sustainable Building Technical Manual, a publication sponsored by the DOE, suggest guidelines as a strategic management approach to incorporating sustainability into the building design process. The following steps allow a county to plan with a design professional the best way to establish and achieve sustainability objectives:

1. Set a goal: Define a clear vision statement to support sustainable goals in the project. Set objectives for energy efficiency, resource use, air quality and impacts on the surrounding environment. Pass a resolution to officially state the desire to achieve this goal.
2. Survey: Survey other counties' green building projects and programs to obtain more ideas. Choose those elements that will help work towards the goals to incorporate into the design. (To see examples of county green building programs, visit NACo's online Green Government Database at *www.greencounties.org*)
3. Perform a site analysis: Determine features of the building site that should be taken into consideration during construction, such as solar access, topography, run-off and soil type.
4. Assemble a design team: This team may include representatives from the county government, architects, energy consultants, engineers, the proposed building users, construction contractors and Operations & Maintenance staff. Discuss the goals, costs and benefits of the process with the team and research in order to determine building strategies to achieve the performance goals. Using an integrated approach from the very beginning of the design process will enable every team member to contribute vital information to the project and help prevent sustainable design features from becoming an afterthought, or falling away during the design process.
5. Pre-design: Investigate energy-related design concepts that take into consideration the environment, climate, building orientation and other features that will impact performance. Establish criteria for green design to clarify the most important aspects of the project. Develop a project budget and schedule that include energy-strategies to meet the performance targets.
6. Schematic design: Do preliminary simulations of various options and technologies and then compare the results to your target to know which strategies meet your goal. Consider the site for the building in order to enhance performance and select technologies that help deliver higher indoor environmental quality. Choose mechanical systems based on anticipated system performance and loads and prioritize options for design based on environmental guidelines, budget, and scheduling constraints.
7. Building program development: Refine the project and confirm that the performance target can be achieved. Identify elements of design that will require careful specification and assemble resources that explain installation, operation and other requirements. Describe the general purpose of the building and the uses for each individual room and then articulate the criteria for achieving environmental goals.
8. Construction and bid documents: Select a qualified construction team that is able to execute the specified strategies to meet the design target and use a contractor who has a track record for constructing green buildings. Offer clean contracting incentives to encourage the use of clean fuel technologies. Only accept key features and systems that have been produced from qualified manufacturers.
9. Recognize achievements: Receive recognition from government agencies, the media and other third party organizations. Issue a press release and apply for a green building award. (For more information on green building achievement awards, see the "National Ratings, Certifications and Standards" section on page 7.)

Johnson County, KS Sunset Office Building

Protect the Existing Environment

A building's site affects the local environment and established living systems in the area. To the greatest extent possible, design the building to integrate with its proposed surroundings. Construct buildings near other commercial sites, or on existing sites that have been developed in the past, so as to minimize the disturbance to the existing area.

Marin County, California has carefully divided the county into six planning areas that correspond with the county's watersheds and specifically set aside an area for urban de-

velopment. No new development is allowed near environmentally-sensitive areas; rather, buildings are constructed close to services, transportation and jobs. Over three-quarters of land in the county is protected from development.

Soil

Soil can have significant effects on the building process and should be considered during facility design. It sustains plant life, filters water and diffuses pollutants. Smart Communities, an educational program working to help communities worldwide better understand the elements of success and survival in the new global economy, offers the following suggestions for protecting soil during the building process:

- disturb the native soil as little as possible;
- work with existing topography to prevent removal of the native soil and, when removal of soil is unavoidable, stockpile the existing topsoil for reuse;
- restrict construction equipment to areas that will eventually be paved over and till any other compacted soil;
- add amendments, such as sand, gravel or humus to the soil only under the advice of a professional;
- use existing drainage patterns rather than creating new ones; and
- use silt fences, soil tackifiers, jute netting, hydroseeding or mulch to prevent sediment from eroding during and after construction.

Mercer County, New Jersey has set requirements to prevent erosion during any construction projects occurring in the county. Some of these requirements include:

- temporarily seeding or mulching any disturbed soil that will be left exposed for more than 30 days without being subject to construction equipment;
- seeding or sodding all exposed areas no more than 10 days after final soil disturbance;
- temporarily seeding or covering with straw mulch critical areas subject to erosion immediately after disturbance;
- daily stabilization of steep slopes where pipelines are being installed; and
- covering any soil with a pH (the measure of acidity in the soil) of 4 or lower with at least a foot of soil with a pH of 5 or more.

Vegetation

Plants can purify air, modify climate conditions and prevent erosion. Native plants are naturally adapted to local conditions and therefore do not need pesticides, fertilizers, or mowers to survive. Additionally, native plants can maintain the biodiversity of the area by attracting many varieties of animals and insects. They often have a deep root system, stabilize soil better than grass and are more efficient at containing carbon dioxide.

The USEPA reports that using trees for shading can lower energy bills by 25% and that air temperature is up to 25% cooler in the shade. In order to take advantage of the benefits plants can provide, the USEPA recommends the following:

- select native plants that thrive under the conditions of the site;
- choose longer-lived plants that will need to be replaced less frequently;
- use the greatest diversity of plants that is possible;
- plant densely in order to better retain water;
- use organic fertilizer when necessary;
- water early in the day;
- use mulching and composting to keep plants healthy (for more information on composting and mulching, see NACo's Green Government Initiative "Solid Waste Management, Recycling & E-Waste" fact sheet at *www.greencounties.org*); and
- when using lawn equipment is necessary, use hand tools rather than power tools and electric tools rather than gas.

The Environmental Management Division of Volusia County, Florida, uses its Re-Green program to fund the planting of native Florida trees in areas to which the public has access. The program also uses plants to prevent dune erosion. The county has found that it reduces costs and maintenance needs by using native plants, as well as provides food and shelter for natural wildlife.

Multnomah County, Oregon has developed a guidebook for use by facility managers to assist with managing building operations in a more sustainable way. Many of the guidebook's recommendations pertain to vegetation around the building. The guide suggests using a diverse mix of plants native to the area, minimizing area covered by lawn, using trees to provide shade, planting flowering vegetation to attract birds and animals and grouping together plants with similar water needs.

Pavement

Traditional impermeable pavement can cause run-off, flooding, erosion, loss of soil

County Case Study:

Will County, Illinois
Population: 642,813
County Seat: Joliet

The Forest Preserve District of Will County, Illinois incorporated several green building principles into its Sugar Creek Administration Center, including site preservation, water filtration, energy conservation and the use of recycled materials.

The Administration Center is located in a forest preserve along Sugar Creek in a former agricultural area. The site plan took into account the existing grade, water drainage patterns and vegetation in order to minimize the costs of building and the environmental impact, while preserving natural biotic processes.

Stormwater is managed above ground, allowing more opportunities for it to seep through the soil and be filtered and purified. The stormwater is also collected and flows through a system of pools before entering Sugar Creek. Rather than adding foreign flora, the building's landscaping uses native plants and prairie grasses for decoration.

Automated systems control energy use in order to maximize efficiency and overhangs on the roof shield windows from direct sunlight. Meeting rooms and offices are lit by natural daylight, with light sensors that dim lights as the natural daylight increases. The bathroom tiles, partitions and countertop all contain recycled materials, while recycled concrete was used to make wall panels and the carpet contains recycled plastics.

fertility, heat sinks and uncomfortable glare. Environmentally-friendly pavement, on the other hand, is permeable, allowing the water to run into the ground, where it can be filtered. This pavement can be produced with recycled materials. Additionally, it's safer in the winter, because water filters through rather than freezing quickly on the surface. Three examples of green paving options include:

- asphalt/concrete, which is similar to normal pavement, without the fine particles of the traditional version, allowing it to be permeable to water;
- plastic pavers, a plastic grid that allows grass to grow through a series of holes; and
- concrete pavers, blocks of traditional concrete with spaces in between them for water to drain.

Permeable pavement is weaker than traditional pavement and so should be used only in parking areas or walkways rather than high-traffic roads. Smart Communities suggests the following actions for limiting problems with traditional pavement:

- minimize the area covered by pavement to what is actually necessary and will be used regularly;
- consider the existing infrastructure and construct the building in an area easily accessible by roads and public transportation;
- use permeable paving materials, such as porous asphalt or porous cement concrete, to allow water to filter through in parking areas;
- use crushed stone or brick for light-duty paths and roads; and
- choose pavement type based on climate conditions to avoid glare or unwanted heat gain.

Additionally, in order to maintain permeable pavement, conduct regularly-scheduled vacuuming and jet washing of the pavement surfaces and limit the use of deicing chemicals.

King County, Washington's employee parking lot consists of nine different sections. One of these sections is traditional asphalt and the other eight consist of different types of permeable pavement, including gravel-filled interlocking concrete blocks, soil-and grass filled interlocking concrete blocks, plastic grids filled with gravel and plastic grids filled with soil and grass. Observers state that the runoff from these areas is cleaner than that from the traditional asphalt.

Green Transportation

According to the USEPA, motor vehicles are responsible for over 50% of nitrogen oxide pollution, 42% of VOCs, 25% of particulate matter and 80% of carbon monoxide emissions. Additionally, the Smart Growth Network (SGN), a partnership between the USEPA and many other organizations (including NACo) working to encourage development beneficial to the economy, community and environment, reports that the further the distance between work and home, the more likely it is that employees will use a car for transportation. Choosing a site near the homes of prospective employees will allow them to walk or bike to work.

Building bicycle parking areas will also make biking to work easier, benefiting the facility, environment and employees. The facility may pave less area for parking lots, as fewer employees will bring their cars to work and the environment will be polluted by fewer emissions from vehicles. The employees will benefit from the exercise; the SGN reports that 60% of the American population is overweight and this daily exercise can help to lower that statistic.

Siting the facility near public transportation will help decrease vehicle emissions and the amount of parking space necessary because employees who live too far away to walk or bike can still use mass transit. Subsidizing employees' public transportation costs can also encourage them to choose these options.

Ada County, Idaho encourages employees to use public transportation, carpool, walk or bike to work. The county subsidizes bus passes and commuter vans for employees. Additionally, if a carpooling employee has an emergency or works overtime, the employee may be reimbursed for a cab ride home. Employees who carpool receive free parking and there are also racks for employees to leave their bicycles. Showers are provided for those who bike or walk to work.

The county buildings in Carroll County, Maryland are located near their intended users so as to decrease travel. The county also frequently sends staff to green building workshops in order to learn how to make more environmentally-friendly improvements.

Several counties have received recognition from Best Workplaces for Commuters SM©, which offers employers who encourage green commuting for their employees recognition, assistance, training and informational forums. To be recognized, an employer must offer access to an Emergency Ride Home program and three supporting benefits (carpool matching, shuttles, etc), as well as do one of the following:

- contribute at least $30 each month for a transit or vanpool pass to each employee who uses these modes of transportation;
- use a telework program that reduces the number of commuting trips made by employees by at least 6%;
- pay every employee who leaves his/her car at home and commutes daily at least $30 each month; or
- any other benefit agreed to by the program that provides similar benefits for employees and the environment.

Wake County, North Carolina has been recognized as one of the Best Workplaces for Commuters. The county offers employees a UPASS, allowing them to ride on Capital Area Transit buses for free. Additionally, it subsidizes the purchase of bus passes for the Triangle Transit Authority and for vanpools, as well as provides an Emergency Ride Home program and a carpool matching service. (For more information on Best Workplaces for Commuters, see the Additional Resources section at the end of this fact sheet.)

Green Building Materials

Using environmentally-friendly materials can offer significant advantages such as lower initial, operating and disposal costs, reduced liability, better building efficiency, im-

County Case Study:

Sarasota County, Florida
Population: 366,256
County Seat: Sarasota

Sarasota County has set an example by using green building standards for its own facilities, as well as taken measures to encourage green building for residents and local businesses. In 2005, the county resolved that all county facilities must be sustainable and meet the highest level of building certification possible. County buildings are designed to be energy efficient, use renewable energy and conserve water.

A year later, Sarasota County became the first county to accept the AIA's 2030 Challenge, pledging to design carbon-neutral county buildings. The county is home to the North Sarasota Public Library and Twin Lakes Park Green Office Complex, both of which are LEED Gold certified.

The county has also initiated a certification-based green-building program to encourage residents and small businesses to incorporate green measures into their buildings. Participants constructing commercial buildings must build to LEED standards and they are eligible for fast track permitting for building permits and lower building permit fees. Additionally, one building in each category is awarded the county's Green Building Award each year. By the end of 2007, there was almost 400,000 square feet of green retail space in the county, including a LEED certified Whole Foods Market and a green regional Girl Scout headquarters.

proved employee productivity and increased awareness of environmental issues. Consider the following guidelines to select sustainable materials for facility construction:

- reuse materials, such as doors, cabinets and some metals and glass;
- use materials with recycled content and those that can be recycled back into their original manufacturing process;
- use renewable materials such as plant fibers, wood and wool that can be regrown or replaced within a few decades;
- use products made with local labor and material to cut down on transport;
- use materials appropriate for the region's climate;
- use materials that will need to be replaced less frequently and that are easily dismantled for reuse or recycling;
- use materials with low toxicity; and
- recycle construction materials. (For more information on construction and demolition debris recycling, see the NACo Green Government fact sheet on "Solid Waste Management, Recycling & E-Waste", available at *www.greencounties.org*.)

Story County, IA Human Services Center

Miami-Dade County, Florida's bid documents for building renovation encourage the use of environmentally-friendly materials, processes and methods of installation. Bidders generally are encouraged to offer their services to remove and recycle existing carpet, as well as use materials that contain post-consumer content or are recyclable, have lower levels of VOCs, or require smaller amounts of wet adhesive in the installation process.

Pima County, Arizona encourages builders to use green materials to construct local facilities. The county suggests reusing existing materials, reducing material use, using materials made from renewable sources and using materials produced locally. More specifically, the county recommends the use of adobe, rammed earth, lime cement and bales of straw, all of which are locally available.

In addition to using recycled or local products, substitute biobased products for petroleum-based ones. A few examples of biobased products that can be used in facility construction include:

- adhesives;
- carpet;
- paint;
- sealants; and
- insulation.

These products are less toxic than others, creating a safer work environment and producing less pollution and hazardous wastes. Additionally, they are cost effective and reduce reliance on foreign oil. Due to the fact that the materials to make these products are generally produced in rural settings, biobased products can also create jobs in rural areas and support the farm economy. (For more information on finding biobased products, see the Additional Resources section at the end of this fact sheet.)

Funding Commercial Green Buildings

Funding sources for green construction projects can include allocating county funds, taking out loans, issuing bonds, third-party financing and lease-purchase agreements.

Allocating County Funds

Allocating county funds sometimes yields less money than do other options; however, the county is still able to retain complete control over the operation of the system and is the beneficiary of all savings. Some local governments have set up funds that allow some energy savings to be reinvested into new energy-efficiency projects.

Dane County, Wisconsin allocated $44 million dollars for the construction of its new justice center. The facility was built to Leadership in Energy and Environmental Design (LEED) standards, designed to integrate with the building site and reused 54.6 tons of materials.

Dane County estimates that its justice center saves 50% in electricity consumption and 37% in overall annual operating energy. Additionally, the county expects the full project cost to have paid for itself long before the building life expires. (For more information on the Dane County Justice Center building, visit the NACo Green Government Database at *www.greencounties.org*.)

Loans

Borrowing money from commercial banks, pension funds, insurance companies or other financial institutions allows the county to obtain financing for the project without allocating money from other recipients of county funds. However, interest still has to be paid on the borrowed money and the county is responsible for repaying the debt even if the savings are not as high as anticipated.

In order to fund its solar energy project in 2004, Butte County, California borrowed

$3.2 million from the California Energy Commission and $1 million from the Butte County Investment pool at a 3.95% interest rate. Payments of $313,000 each year will repay the loans in 13.2 years. The cost savings from the system were about $317,000 in 2004 and it is estimated that over the course of 40 years, the net savings after the repayment of loans will be $8.5 million.

Bonds

Bonds are similar to loans; however, they are also more difficult and complex to arrange. General obligation bonds require a referendum vote to issue; a revenue bond system is initiated in anticipation of future savings from the project that they would finance.

King County, Washington is using $172 million in capital bonds supplied by supportive residents in 2004 to renovate and replace libraries in the county. Enhancements for all 43 of the county's libraries have been planned to meet the community needs for the next decade. The county requires the Leadership in Energy and Environmental Desigh (LEED) Green Building Rating System for each of the buildings and all new facilities are built in urban areas near transit centers, where they can use natural light. None of these green changes to the building would have been possible without the funding raised through bonds.

Third-Party Financing

Third-party financing occurs when private businesses create a performance contract to invest in energy retrofits for the county. The private business will pay for and install the system and, in return, receives a share of the energy cost savings for the duration of the contract, after which time the county receives all profits. There are four methods of payment to the energy provider/financier, as described below:

- fixed percentage, in which the contractor receives a percentage of the energy savings for a predetermined period of time;
- direct payout, in which the contractor receives all of the savings for a predetermined period of time;
- fixed saving, in which the county is guaranteed a certain level of saving and the contractor covers any shortfalls and receives any excesses; and
- flat fee, in which the contractor is paid a fixed amount for the energy retrofits.

Flathead County, Montana worked with Johnson Controls, Inc. (a global leader in building efficiency and power solutions) to renovate several county buildings, including the justice center, juvenile detention center, courthouse and administration buildings. Together, they initiated a county-wide energy management control system, implementing lighting and heating, ventilation and air-conditioning (HVAC) retrofits as well as other updates. This is expected to save the county more than $160,000 annually in utility and operation costs, as well as prevent two million pounds of carbon dioxide emissions.

Whatcom County, WA Courthouse

Allegheny County, Pennsylvania and Westmoreland County, Pennsylvania both used guaranteed energy savings agreements with NORESCO (a leading energy services company) to move ahead of the carbon and energy cost curves. Allegheny County improved more than 100 buildings, covering 3.4 million square feet. With conservation measures tailored to each building, the project is calculated to conserve more than 50 million gallons of water per year, more than 13 million kilowatt hours of electricity per year and more than 120,000 therms of natural gas per year.

Westmoreland County implemented energy upgrades to 12 buildings, covering 1.1 million square feet. Lighting improvements alone are calculated to save $150,000 per year. Public spaces, such the courthouse, benefit from better HVAC control. Specialized spaces, such as Westmoreland County Prison and Westmoreland Manor (a licensed nursing facility) received new boilers and the boiler savings funded other efficiency measures, including a complete water conservation project at the prison.

(For more information on performance contracting, see the NACo Green Government Initiative "County Buildings Energy: Efficiency and Performance Contracting" fact sheet, located at *www.greencounties.org*.)

Lease-Purchase Agreements

In a lease-purchase agreement, a third party provides the equipment necessary for the green project. The county uses the savings that it gains from the increased efficiency of the project to make payments on the equipment. At the end of the lease agreement, the county can keep the equipment.

National Ratings, Certifications and Standards

Rating systems and certifications for green buildings can be important tools for counties working on green building projects. These national standards provide a consistent framework on which counties can develop their own green building approach. Below are descriptions of several nationally-recognized green building ratings, certifications and standards programs which counties may wish to consider for developing green building programs or adopting incentives.

ENERGY STAR

First introduced for commercial buildings in 1999, the ENERGY STAR is the national

County Case Study:

New Castle County, Delaware
Population: 523,008
County Seat: Wilmington

In May 2007, New Castle County, Delaware opened its new Public Safety Building, designed to be environmentally-friendly. The building reduces the use of electricity by using a geothermal heat pump, a Building Automation System to control air-conditioning, heat and ventilation and special glass to prevent heat loss. The building also controls its energy use through lighting technology, such as controls which make use of natural light and room occupancy sensors and a sky light over the main corridor.

Additionally, the Public Safety Building collects rainwater for later use and made sure to recycle scrap materials from the construction process. The county has applied for LEED Silver Certification for the building.

symbol for energy efficiency in America, which thousands of new homes and commercial and industrial facilities have earned for superior energy performance.

ENERGY STAR rates the energy performance of commercial and industrial facilities on a scale from 1-100. Those facilities that achieve a score of 75 or higher are eligible for the ENERGY STAR, indicating that they are among the top 25% of facilities in the country in terms of energy performance. NACo offers member counties assistance to benchmark the energy use of their buildings using ENERGY STAR's Portfolio Manager. At this time, NACo has helped upload 306 county buildings, nine of which have earned the ENERGY STAR award.

ENERGY STAR also sponsors the ENERGY STAR Challenge, a national call-to-action to improve the energy efficiency of America's commercial and industrial buildings by 10% or more. Challenge participants and their members are encouraged to take as many of these actions as possible:

- design commercial buildings to be energy efficient;
- measure and track energy use;
- develop a plan for energy improvements;
- make energy efficiency upgrades;
- help spread the energy efficiency word to others, and;
- become an ENERGY STAR partner.

Each of the nation's 3,068 counties has the opportunity to play a vital, dual role in the Challenge - leading by example by improving their own buildings, and leveraging their relationships with private sector organizations to motivate them to make energy efficiency improvements as well. Fifty-five counties are currently participating. To learn more, see the "Improving Energy Efficiency in County Buildings" Guide at *www.greencounties.org*.

Blue Earth County, Minnesota, received an ENERGY STAR for its 120-year-old courthouse. The county worked to improve the performance of the facility and continues to track its energy use through ENERGY STAR's Portfolio Manager. Some of the energy improvement measures adopted by the county included:

- compact fluorescent light bulbs;
- energy-efficient flat screen monitors;
- a properly-sized cooling tower with drift eliminator;
- diesel generators to reduce electrical costs;
- insulating ductwork and patching leaks;
- cleaning the heating and cooling coils; and
- implementing an aggressive recycling program.

Leadership in Energy and Environmental Design (LEED)

The LEED Green Building Rating System is administered by the USGBC, which represents more than 16,500 organizations from across the building industry working to advance structures that are environmentally responsible, profitable and healthy places to live and work, . LEED is a voluntary, consensus-based national rating system for developing high-performance, sustainable buildings and addresses all building types and emphasizes state-of-the-art strategies for sustainable site development, water savings, energy efficiency, materials and resources selection and indoor environmental quality. Buildings may be awarded a certification of Certified, Silver, Gold, or Platinum rating, based on the number of points which are earned. As of August 2008, more than 3 billion square feet of real estate is involved in the LEED system, including more than 1,800 LEED certified projects and 14,000 LEED registered projects. In addition, there are more than 200 local government certified projects, representing 22 million square feet. And, there are more than 1,500 LEED local government projects in the pipeline as registered projects, representing more than 280 million square feet. (For more information on LEED, visit *www.usgbc.org* and click on "LEED" on the top navigation bar.)

When Johnson County, Kansas was building a new office building on Sunset Drive, it decided to design to green building standards with regard to water, site disturbance, energy use and materials. The building catches rain and filters it in the lobby and uses waterless urinals and toilets flushed with recycled water. Water fixtures are low-flow and hands-free. The building design reduces energy usage by 45% by using highly efficient mechanical systems, a building automation system, daylighting and computer controlled lighting. During site preparation, as much of the existing habitat and trees as possible were preserved and no permanent irrigation systems were created.

During construction, 90% of construction waste was diverted from landfills and, when possible, local and regional materials were used (20% of building materials were manufactured within a 500 mile radius of the site). Many of the materials were reused; for example, the county used redwood from a local demolished building and also used recycled glass to create the terrazzo floor. The facility is built from low-emitting materials and source pollutants are contained.

The result is a 129,000 square foot, high performance office building located on a 17 acre site that was completed ahead of schedule and within budget. The facility received a LEED Gold rating. The county has received a positive reaction from the public and the media and has received requests for tours from counties across the country. The facility saves more than $100,000 annually in utility expenses and has projected a 10-year payback for the construction costs.

Currently, Blue Earth County, Minnesota is working to build an environmentally-friendly justice center. Construction on the $38 million building will account for only 10% of the building's cost over a 30 year cycle. The building will use geothermal heating, lights that automatically dim when sunlight is available, roofs that absorb moisture and ponds to filter stormwater. Provided that everything proceeds according to plan, the justice center will be the first in south-central Minnesota designed to meet LEED standards.

Green Globes

Green Globes™ is a system from the Green Building Initiative designed to rate new or existing buildings. Started in Canada in 1996, it spread to the U.S. in 2000. The system uses

a 1,000 point scale to assess the environmental impact that buildings cause in the following areas:

- energy;
- indoor environment;
- site impact;
- water;
- resources;
- emissions; and
- project and environmental management.

If a self-assessment of the building yields a score of at least 35%, the building is eligible for an independent review in order to get a formal Green Globes rating. Buildings may earn from one to four globes, depending on the level of performance. The Green Globes self-assessment costs $250. (For more information about Green Globes certification, visit *www.greenglobes.com*.)

Summit County, Colorado earned two Green Globes for its Material Recovery Facility, completed in 2006. The building used recycled content in the steel structure, carpeting, rubber flooring and building materials. Erosion is controlled, with stormwater paths carefully managed. Lighting energy is saved by using daylight and high-efficiency lighting fixtures. Additionally, emissions are reduced by using filtration systems and paint without VOCs and by providing bicycle parking to encourage employees to commute without cars.

Encouraging Green Commercial Buildings in the Community

In addition to making county-owned facilities greener, many counties across the country have worked to encourage businesses to construct environmentally-friendly facilities. This encouragement can take the form of incentives, codes or ordinances, or guidelines.

Codes and Ordinances

Codes and ordinances are the strongest way to compel businesses to comply with green building standards. The benefit of creating an ordinance or policy is that more residents and businesses may comply; however, it can also present problems for facilities where it would be impractical to do so. The NACo County Green Programs survey, conducted in June 2008 of 147 counties nation-wide, reports that 34% of those counties surveyed have an ordinance, resolution, code, or formal policy focused on establishing or enabling a green-building program.

New Castle County, DE Public Safety Building

The International Code Council (ICC), an associate sponsor of NACo's Green Government Initiative, has created the International Energy Conservation Code (IECC), a model energy code that is adaptable to different climate zones. State and local jurisdictions may adopt this code as a model for their own energy code. (To purchase the latest version of the IECC, visit *www.iccsafe.org* and click on the ICC Store.)

Additionally, the Building Codes Assistance Project (BCAP) works to help local governments with the adoption and implementation of building and energy codes by conducting workshops, advising on legislation and delivering information on local code activities in newsletters and through the website. (For more information on BCAP, visit *www.bcap-energy.org/*.) The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) provides a Code Compliance Manual, available at http://*www.energycodes.gov/comcheck/89_compliance_manual.stm*.

Some states only have limited authority to adopt energy codes; in these cases, counties may do so instead. Counties may also adopt energy codes that are stricter than those of the state.

The ICC recommends the following steps for creating a green ordinance:

1. understand the direction in which the local council/board wishes to go, as this will make it easier to gain support for the project;
2. decide whether a mandatory or voluntary program would be more effective for the county;
3. research successful green programs in nearby counties;
4. consider using a team of elected officials, county staff, developers and builders and the public to discuss building design;
5. work with the Planning Commission;
6. hold a "sustainability workshop" to educate the public on green building;
7. select the guidelines and standards that are appropriate for the county and may be already in use in neighboring counties;
8. consult with a legal counsel so that proposed standards do not conflict with laws already in place;
9. consider using outside resources to help with the building inspection;
10. use realistic compliance thresholds;
11. keep the environment, economy and social equity in mind;
12. determine how the program will be funded;
13. choose a staff member to champion the process of building development; and
14. educate staff members, developers, builders and residents on green building principles and the county's new program.

(Look for more information on energy and green codes in a future NACo Green Government Initiative fact sheet coming in Fall 2008.)

Montgomery County, Maryland started a green building program in November 2006, mandating LEED standards for buildings in the county. County buildings, defined as any building with more than 30% of its construction costs funded by the county, that are larger than 10,000 square feet must meet LEED Silver standards. Additionally, any non-residential building in the county is required to qualify for a LEED certified standard.

Incentives

Incentives provide a reward for businesses that build to green standards. This type of program may be popular because it provides encouragement for green building without forcing anyone to participate; however, counties must then find an alternate source of money to replace the funds lost through the waived permit fees or other incentives.

The June 2008 NACo County Green Programs survey revealed that those counties surveyed provided the following incentives:

- tax credits (4%);
- reduced permitting fees (1%);
- expedited permitting process (6%);
- marketing (5%); or
- other (11%).

Arlington County, Virginia has established a voluntary program to encourage developers to follow LEED standards. As an incentive, the county board will allow the building to request additional building density or height in exchange for official LEED Certification from the USGBC. Eligible buildings must guarantee a LEED rating of at least the certified level, with more bonus density consid-

ered for Silver, Gold and Platinum LEED certification. If developers choose not to commit to LEED building standards, they contribute to the Green Building Fund at a rate of three cents per square foot. This fund is used to provide outreach and education about green building to the community and developers.

King County, Washington passed a new Green Building and Sustainable Development Ordinance in July 2008. It requires all county owned and financed LEED-eligible buildings to achieve a LEED Gold rating, within certain budgetary parameters, based on life cycle cost analysis. In addition, it requires projects that do not qualify for LEED, such as pump stations, roadways and other infrastructure projects, to complete a sustainable development scorecard. The scorecard will track the fiscal, environmental and functional benefit attributes of the projects. The county provides GreenTools, a program to help those involved in green building and offers grants from the Department of Natural Resources and Parks to buildings that will earn LEED ratings. LEED Silver buildings are eligible for $20,000; LEED Gold buildings for $25,000 and LEED Platinum for $30,000.

Howard County, Maryland has adopted LEED standards for all commercial buildings in the county. The minimum requirement for private commercial buildings is a LEED certified designation, while public buildings must be built to LEED Silver standards. Additionally, the county gives tax credit incentives for LEED Silver, Gold and Platinum facilities.

Guidelines provide suggestions for local businesses to construct greener facilities. They are completely voluntary and offer no incentives. This means that the county does not lose funding from waiving fees; however, there is also less motivation for businesses to follow these guidelines because they are neither forced to do so, nor do they receive any immediate reward. Counties using this type of program need to educate residents and businesses on the potential future savings of green buildings to encourage them to build in this manner.

San Mateo County, California has created a Sustainable Buildings Guidelines and Checklist booklet to assist county residents and businesses build green. The guide specifies that the user should tailor the list of ideas to the needs of the specific site or program and is divided into these 13 areas:

- community planning;
- site and landscape;
- waste reduction and management;
- concrete;
- wood framing;
- exterior treatments;
- windows and doors;
- plumbing;
- electrical;
- heating, cooling, insulation and ventilation;
- renewable and solar energy;
- interior materials; and
- other green alternatives.

The guide is designed to show the user the green steps and factors that can be incorporated into the building project at each point. Goals and strategies are suggested in each of the 13 areas and checklists with all of these strategies are provided. These checklists are also available at Planning and Permitting Departments in the county. (To see the entire text of the Sustainable Buildings Guidelines and Checklist booklet, see the Green Database at *www.greencounties.org*.)

Founding/Lead Green Government Initiative Sponsors

Founding members of the NACo Green Government Initiative can assist in your county's green commercial building efforts.

American Institute of Architects (AIA)

www.aia.org/walkthewalk

For 150 years, members of AIA have worked with each other and their communities to create more valuable, healthy, secure and sustainable buildings and cityscapes. AIA members have access to the right people, knowledge and tools to create better design and through such resources and access, they help clients and communities make their visions real. The AIA is committed to providing sustainable design tools and resources to its members and clients.

Johnson Controls

www.jci.com

Johnson Controls helps county governments get the most from their budgets through a comprehensive approach to sustainable practices—from green buildings and renewable energy to water and traffic infrastructure improvements. As a U.S.Green Building Council board member, recognized champion of supplier diversity and leader in traditional and hybrid vehicle batteries, Johnson Controls is a valued resource for developing and implementing sustainable practices.

NORESCO

www.noresco.com

NORESCO is one of the nation's leading energy service companies providing comprehensive and proven energy-efficiency solutions, infrastructure development and operations strategies to a wide range of customers since 1984. The company has installed $2.5 billion of proven energy solutions in more than 20,000 facilities including municipal buildings, schools, courthouses and civic centers and transportation facilities.

Siemens USA

www.usa.siemens.com

The United States consumes 24% of the world's energy and contributes 23% of the world's CO2 emissions. Siemens is actively working to help US counties become environmentally responsible and effective. Their mission is to help counties manage their buildings' energy costs, improve reliability and enhance performance while having a positive impact on the environment.

U.S. Green Building Council

www.usgbc.org

With more than 16,500 member companies and organizations, the U.S. Green Building Council (USGBC) is the nation's foremost coalition of leaders from across the building industry working to advance buildings that are environmentally-responsible, profitable and healthy places to live and work. Driving its mission to transform the built environment is the Council's LEED® (Leadership in Energy and Environmental Design) Green Building Rating System™, which is accessible on-line and supported by a robust LEED Workshop program and the LEED Professional Accreditation program

Conclusion

Green commercial buildings use less energy and resources than do traditional business facilities and they produce less waste while providing a healthier environment for employees. Using environmentally-friendly building techniques can provide environmental, health, productivity and community benefits, as well as decrease operating costs. By designing and facilitating green building projects, counties can experience a reduced impact on county infrastructure, an increase in property values, market growth for local green builders and suppliers and healthier residents.

The number of green building programs are growing quickly; over the last three years they have increased by over 400%. However, the NACo County Green Programs reports that 86% of counties surveyed do not require or promote a green building standard in commercial buildings and 75% do not own or operate a green-certified building. As concern for the environment and energy prices rise, awareness of the importance of green building is also increasing.

Additional Resources

Best Workplaces for Commuters

www.bwc.gov

Best Workplaces for Commuters is a program managed by the Center for Urban Transportation Research to provide qualified employers with recognition for offering benefits to encourage employees to choose green commutes. The website offers information about participation benefits, as well as a list of participating employers, including counties.

Codes101 from the Department of Energy (DOE)

www.energycodes.gov/moodle/course/view.php?id=7

This is online training provided by the DOE to educate those new to the subject about energy codes.

Database of State Incentives for Renewables and Energy (DSIRE)

www.dsireusa.org/

DSIRE is a database of information on state, local, utility and federal incentives that promote renewable energy and energy efficiency.

ENERGY STAR

www.energystar.gov/index.cfm?c=business.bus_index

ENERGY STAR is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy helping save money and protect the environment through energy efficient products and practices. ENERGY STAR offers information about improving energy efficiency, energy efficient products and tracking energy use. ENERGY STAR also offers several tools to help improve energy efficiency. Portfolio Manager is an ENERGY STAR interactive energy management tool that allows the tracking and assessment of energy and water consumption across an entire portfolio of buildings in a secure online environment. TargetFinder is an ENERGY STAR tool that helps architects and building owners set aggressive, realistic energy targets and rate a building design's estimated energy use.

Funding Resources from the U.S. Environmental Protection Agency (USEPA)

www.epa.gov/greenbuilding/tools/funding.htm

The USEPA provides a list of national, state and local programs that can help fund green building projects.

Green Globes

www.greenglobes.com/

Green Globes delivers an online assessment protocol, rating system and guidance for green building design, operation and management.

International Council of Shopping Centers (ICSC)

www.icscseed.org

ICSC's Sustainable Energy and Environmental Design (SEED®) Program highlights the best practices of the retail real estate industry in the areas of energy efficiency, sustainable design and environmental awareness. Shopping centers and retail tenants are committed to protecting the environment and promoting a better quality of life in each of our communities. SEED® encourages industry-wide innovation and education on how to serve today's customers while protecting the environment for future generations.

National Association of Industrial and Office Properties (NAIOP)' Green Building Incentives

www.naiop.org/foundation/greenincentives.pdf

NAIOP, the nation's leading trade association for professionals in industrial, office and mixed-use commercial real estate, has identified government incentives for green development across the country, which can be found on their website.

Smart Growth Network (SGN)

www.smartgrowth.org

Formed in 1996, the SGN is a partnership between the USEPA and several non-profit and government organizations, including NACo. It encourages development that serves the economy, community and environment.

Sourcebook on Natural Landscaping for Public Officials

www.epa.gov/greenacres//toolkit/index.html

A publication of the USEPA, the Sourcebook provides information on natural landscaping.

United Soybean Board (USB)'s Soy-Based Product Catalog

www.soybiobased.org/productinfo/

The USB maintains a list of soy-based products and their manufacturers' contact information.

USGBC Playbook for Green Buildings + Neighborhoods

www.greenplaybook.org

The Playbook for Green Buildings + Neighborhoods is a project of the USGBC and over 20 cities, counties and organizations, which provides local governments with guidance and resources to rapidly advance green buildings, neighborhoods and infrastructure.

About the NACo Green Government Initiative

The NACo Green Government Initiative serves as a catalyst between local governments and the private sector to facilitate green government practices, products and policies that result in financial and environmental savings. Launched in 2007, the Initiative provides comprehensive resources for local governments on all things green, including energy, green building, air quality, transportation, water quality, land use, purchasing and recycling.

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