



Leaders at the Core of Better Communities

Local Governments and EPA's ENERGY STAR® Program

Case Study Series: EPA's ENERGY STAR National Building
Competition Participants

3/1/2014

This publication has been developed to assist local government officials attain greater energy efficiency for their community members through ENERGY STAR program offerings. This report was researched and written by ICMA, through a subcontract agreement with The Cadmus Group, Inc. (TO Agmt No. 4382C&I-ICMA-1; TO No. 105(EPB13H00090)). The Cadmus Group, Inc. (Cadmus) provided overall guidance and project direction. The work that provided the basis for this publication was supported by funding under an award with the U.S. Environmental Protection Agency (EPA Contract No. EP-BPA-12H-0013). The substance and findings of the work are dedicated to the public. The author and publisher are solely responsible for the accuracy of the statements and interpretations contained in this publication. Such interpretations do not necessarily reflect the views of the U.S. Federal Government.

Local Governments and the ENERGY STAR National Building Competition

The U.S. Environmental Protection Agency's (EPA) ENERGY STAR® National Building Competition: *Battle of the Buildings*, is a contest hosted annually since 2010 by EPA for eligible commercial buildings. The goal of the competition is to reduce energy consumption for buildings or tenant spaces over the course of a year. More than 3,200 teams are participating in the 2013 ENERGY STAR National Building Competition, representing all 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands. Competing teams are eligible for recognition in four ways:¹

EPA's ENERGY STAR National Building Competition – Recognition Categories

1. The **Overall Winner** is the building or space with the most reduced energy use on a percentage basis over the course of the competition
2. The **Most Valuable Participant (MVP)** is awarded to the building with the highest combined score of energy use reductions and communications activities. For this award, teams must complete a communications scorecard provided by EPA at the mid-point and end of the competition.
3. The **Top Tenant** is the tenant that reduces energy use the most on a percentage basis over the course of the competition. The 2013 round is the first year that tenants are able to compete in the competition.
4. Any building or space with a reduced energy use of at least 20 percent will have the opportunity to receive **EPA recognition**.

Any commercial building or tenant space that can measure energy use intensity for all fuel sources in the building/space is eligible to compete. Energy

¹ For all calculations, data is normalized to account for weather conditions.

use intensity is calculated by dividing the amount of energy a building consumes annually by the total floor space. Participants must provide at least 12 months of historical energy data for a baseline and submit complete energy use data for the improvement period using EPA's custom report. For the most recent round, the baseline period is January 1, 2012 to December 31, 2012, and the improvement period is January 1, 2013 to December 31, 2013. Participants measure, track and report their monthly energy consumption using EPA's online energy tracking tool, Portfolio Manager™.

Local government in the competition

Local governments have all the right tools to succeed in the Battle of the Buildings. They operate a wide variety of facilities, which are frequently managed by in-house facility and energy experts. However, local governments can also face unique challenges when looking to perform energy upgrades or eliminate energy waste.

Although city councils and managers may support energy reduction, there are often many programs competing for city funds and personnel time. Local governments require the support of city leaders to successfully reduce energy usage. The City of Atlanta, Georgia was a winner in the 2012 Battle of the Buildings and largely attributed its success to the "focused effort of a committed team consisting of representatives from all facility functions...with program support by City leaders."² Local governments must ensure that councils and managers are aware of the positive contributions

² 2012 ENERGY STAR National Building Competition Summary

the competition can make to the environment, local publicity, and the bottom line.

However, city leaders are not the only individuals from whom the city needs to garner support. It is important to attract buy-in from city personnel, who must participate in the energy reduction process in order for it to succeed. Local government buildings often house various departments that may or may not communicate on



Flyers are provided through the EPA website to help promote participation in the competition.

a regular basis. It is important that the departments work together to reduce energy consumption overall. The County of Elk, Pennsylvania was another winner in the 2012 ENERGY STAR National Building Competition. One of its strategies was to implement a facility-wide comprehensive energy policy that eliminated redundant

electronic items (i.e., printers, copiers) and set limits on energy-consuming personal devices. A handbook was distributed to all employees to ensure staff members were made aware of the policy.

Local governments certainly have challenges to overcome in order to participate in the competition, such as the need for support from all levels of the organization. The level of participation among local governments varies from year to year. Six local governments submitted buildings for

participation in the 2013 ENERGY STAR National Building Competition.

This publication provides case studies of three local governments that have participated in the National Building Competition: Charlotte, NC; Cary, NC; and Hillsborough County, FL. Case studies provide insight on ways that local government personnel can promote greater energy efficiency using ENERGY STAR programs and tools.

Key Takeaways:

- EPA's ENERGY STAR National Building Competition has provided a way for local governments to showcase their energy savings success.
- The accessibility and usability of the upgraded Portfolio Manager—which enables easy benchmarking and tracking of energy use—has facilitated the participation of local governments in the competition.
- Combined retrofits/upgrades and behavior modifications are necessary to make the biggest impact in energy savings.

To learn more about EPA's ENERGY STAR National Building Competition, visit www.energystar.gov/BattleOfTheBuildings.



ENERGY STAR® in Charlotte, North Carolina

The City of Charlotte (pop. 735,780) is a local government that decided to take up the challenge.³ The city has long been an advocate of ENERGY STAR and Portfolio Manager™. The local public school system had great success with the 2012 ENERGY STAR National Building Competition, in which Hickory Grove Elementary School was recognized for reducing energy emissions by more than 20 percent that year. In 2013, the City of Charlotte decided to follow suit. The city selected three buildings to participate in its inaugural year participating in the Battle of the Buildings. Charlotte's Government Center was first ENERGY STAR certified in 2009, making it a natural choice. The second building was the Charlotte Police Department Headquarters, a building slated for upgrades expected to improve energy efficiency sufficiently to earn ENERGY STAR certification in the next several years. But perhaps most surprising is the third building that was selected, Charlotte's Old City Hall.



City of Charlotte's Old City Hall

The building was constructed in 1927 and has several historic features that make energy-efficient upgrades more difficult. However, the city has found success in reducing energy consumption through a combination of retrofits/upgrades and behavioral modifications.

Increasing energy efficiency in Old City Hall

Significant work was done on the Old City Hall building in 2011–2012 that has reduced energy consumption. Lighting was one facet that experienced significant renovations. On the basement level, all T12 fluorescent lamps were replaced with T8 fluorescents. The upper floors used historic fixtures for lighting that the city didn't want to replace for fear of losing the historic feel. However, they purchased a retrofit kit to replace the fixtures with induction lamp and ballasts. These new fixtures produce less heat and use less electricity than their predecessors. The city added occupancy sensors to restrooms, break rooms, conference rooms, and kitchen areas to further reduce electricity use. The HVAC system was also renovated to include new high-efficiency VAV boxes, digital controls, and improved air flow. Additionally, the city altered the HVAC zoning in the building to become more energy efficient. Originally, a 24-hour section of the building was linked to the central HVAC, requiring the main system to be on in order to heat or cool this subsection of the building. This area has now been zoned with its own HVAC system, so that the central HVAC can be turned off outside of office hours. These upgrades, completed in 2012, significantly reduced energy consumption and allowed for Old City Hall to become ENERGY STAR certified in 2013. Laurie Sickles, Charlotte's energy

³ 2010 U.S. Census.

and sustainability coordinator stated that these upgrades have allowed Old City Hall to reduce energy consumption by 43 percent.

Because significant building upgrades had been completed the previous year, Charlotte focused on behavioral modifications to further reduce energy consumption during the competition. The energy and sustainability personnel sent out email blasts to building tenants with tips and reminders to reduce their personal energy usage. ENERGY STAR posters and flyers were placed in the main lobby as well as throughout the building. One of the most original behavioral modifications was a game titled "Crab You're It." Coworkers who left their desk lights on came in the next morning to find their desk light off and a stuffed crab on their desk. The game served as a subtle reminder to tenants to change their behavior and went on for six weeks in 2013. Thanks to these efforts, at the midpoint of the competition, the building had reduced energy use intensity by over 13 percent (159.4 kBtu/sq.ft. to 138.5 kBtu/sq.ft.) and prevented 42 metric tons of greenhouse gas emissions. Final numbers have not yet been released.

Future endeavors

Following the completion of the 2013 ENERGY STAR National Building Competition, personnel are ramping up to conduct a large behavioral modification competition in the Government

Center building utilizing ENERGY STAR flyers, posters, and educational videos in 2014. The sub-metered floors in the building will allow individual floors to compete against one another to see which floor can reduce energy consumption the most. The city anticipates that this competition will be a success and hopes to submit the data in the 2014 ENERGY STAR National Building Competition.

Future plans are slated to expand upon the city's use of Portfolio Manager. The goal is to automate building data so that it is easily and automatically uploaded into the system. The City of Charlotte also hopes to include all police and fire stations in Portfolio Manager, and plans to equip police and fire station managers with the ability to view their energy consumption data online and implement a similar competition in the Government Center floors between the two naturally competitive departments.

Sickles indicated that the City of Charlotte is pleased with its participation in the 2013 National Building Competition. "ENERGY STAR is so well branded; it helps to get the word out there." The competition has helped the city encourage tenants to become more energy efficient. The city would like to continue participating in the annual competition, grow to include more buildings and tenants, and expand its communication to residents about the competition.

CASE STUDY | CARY, NORTH CAROLINA

The Town of Cary, NC has a long history of caring for its natural resources. Home to 147,000 residents, Cary is the seventh-largest municipality in North Carolina. With assistance from stimulus funds in 2010, the town was able to hire a Sustainability Manager, Emily Barrett, whose role has helped Cary focus on targeted pilot projects, as well as new ways of managing energy and financing changes. One of those targeted projects has been supporting and encouraging the town's eight fire stations to become more energy efficient, and EPA's ENERGY STAR® National Building Competition and Portfolio Manager™ have helped the stations achieve their goals.

In 2010, Cary was awarded an EPA Climate Showcase Communities award, which allowed the town to focus its funding and efforts heavily on the fire houses. "Fire houses are unique buildings because they are 24/7/365 operations. They are complex buildings, and in addition to saving energy, there is a responsibility to the firefighters and staff to ensure they have a comfortable space," said Emily Barrett. "Sustainability isn't about sacrificing comfort. It's about being smart and

being willing to look at different ways of doing things."

As part of the grant, Cary was able to retrofit six of its eight fire stations and consulted with the fire departments of Chapel Hill, Durham, and Raleigh—all of which had undertaken many initiatives to reduce energy use—to identify additional opportunities. New florescent light bulbs were installed, a tankless water heater was utilized, and "low-hanging fruit" modifications were made to the fire stations in order to make them as energy efficient as possible. Installation of energy-efficient appliances, efficient HVAC systems, and light sensors were all ways Cary fire stations reduced their energy usage. All of these changes contributed to the station's success in the 2012 Battle of the Buildings, with Fire Station 3 finishing first in its category.

In addition, the Chief's Energy Challenge was created by the Town of Cary in conjunction with Chapel Hill, Durham, and Raleigh, NC. The Challenge is an intensive program that uses Portfolio Manager to track its results. Each fire station was challenged to reduce its energy usage by 10 percent in the first year and 20 percent by the third year. Cary's in-house station-to-station challenge took place in 2011–2012. The Challenge contributed to Cary's success in the 2012 Battle of the Buildings, which is unique because a town led initiative lent itself to a larger competition. Portfolio Manager enabled Cary to track the different aspects of the fire station's energy usage as they changed throughout the challenge and created a common platform for stations to track and compare their energy usage in comparison to other stations.



The Chief's Energy Challenge invites fire stations nation-wide to reduce their energy usage.



Station-to-Station Energy Challenge

During the five-month period of Cary's station-to-station challenge, the stations saw an overall reduction of 7 percent in energy usage, with the most successful station reducing its energy usage by 15 percent. "Efficiency relies heavily on behavior," stated Emily Barrett. "Keeping the bay doors closed, turning off lights and computers, taking advantage of natural light, doing full loads of laundry instead of partial loads – behavioral actions yield large results." All of these efforts contributed to Cary's participation in the Battle of the Buildings and provided extra incentive for the stations to be competitive. "Battle of the Buildings is useful as a tool, because it's a competition, and with competitions you can target behavior. Firefighters are competitive. Battle of the Buildings provides a venue to remind people about expectations," says Barrett.

The success of the Chief's Energy Challenge has gone nationwide. Seventeen communities have signed up for the Challenge across the country, and

Cary has helped each community integrate Portfolio Manager as a tracking tool because of its accessibility to the everyday user. Portfolio Manager also offers communities the opportunity for national recognition when they participate in the Battle of the Buildings, which is a natural next step for communities taking part in the Chief's Energy Challenge. Cary is planning to encourage involved communities to participate in the 2014 Battle of the Buildings.

Emily Barrett has big hopes for the use of tools like Portfolio Manager in fire stations across the country. "The more information about fire houses that we can place into a national data set, the more accessible the information will be across the country. The more data points, the better the overall information. We can help people start with a better baseline." The Battle of the Buildings is an outlet to show the success of such data on a national scale.

To learn more about the Chief's Energy Challenge, visit <http://www.chiefsenergychallenge.org>.

Energy Efficiency in Hillsborough County

Located on the western coast of Florida, Hillsborough County is a 1,072 mi² area that includes Temple Terrace, Plant City, and its county seat, the city of Tampa. The county has the fourth largest population in the state at 1,229,226, according to the 2010 U.S. Census.

A commitment to energy savings has been a priority in Hillsborough County for decades. In 1996, the Hillsborough County Board of County Commissioners passed a resolution to participate in the International Council for Local Environmental Initiatives (ICLEI) Cities for Climate Protection Campaign, which required the development of a local action plan for reducing greenhouse gas emissions.⁴ As a result, an Energy Manager position was created in the county and filled in April of 2000 by Randy Klindworth. Klindworth, a Certified Energy Manager (CEM) by the Association of Energy Engineers, has served in this position ever since.

Energy savings have been accomplished through a number of initiatives within the Hillsborough County Energy Program, including the following:

- Policies and directives, such as lighting level standards, air conditioning and heating standards, and the formation of Energy Teams;
- Facility retrofits, including the construction of a Central Chiller Plant installed with two chillers with 3,900-tons of combined

⁴ ICLEI is an international association of local governments who adopt policies and implement measures to achieve reduction in local greenhouse gas emissions to protect the environment.

capacity to supply chilled water for air conditioning; and

- Other reported county-wide energy-saving initiatives across departments, for example the purchase of computer hardware by Information and Technology Services that complies with ENERGY STAR[®] 3.0 and 4.0.

In 2001, the county received recognition for its Water Resources Services Building—the first of five buildings to earn ENERGY STAR certification. Since then, its County Center, Annex Complex, and Main Courthouse have also been certified.⁵ By April of 2014, nine buildings will be certified.

Competing in the National Building Competition

In order to promote greater awareness of the success that Hillsborough County has experienced in achieving greater energy efficiency, the county entered nine of its buildings into the 2013 ENERGY STAR National Building Competition: *Battle of the Buildings*, including eight office buildings and a courthouse.



This historic Hillsborough County Main Courthouse was built in 1952. The building is ENERGY STAR certified and is connected to the chilled water piping network in downtown Tampa.

⁵ A building that earns an ENERGY STAR 1 - 100 score of 75 or above is eligible for ENERGY STAR certification.

Ease of entering the competition was facilitated by recent update to Portfolio Manager™, EPA’s ENERGY STAR online tool for measuring and tracking energy and water consumption. The upgraded Portfolio Manager has afforded other notable benefits, as well. The tool has also been critical to the county’s success in achieving the certifications and increasing efficiency of buildings. “Recent updates to Portfolio Manager (in June 2013) have been fantastic,” Klindworth noted, “The benefit to me as an Energy Manager is that it gives me a standardized way to compare facilities.” Currently, county 150 facilities are in Portfolio Manager.

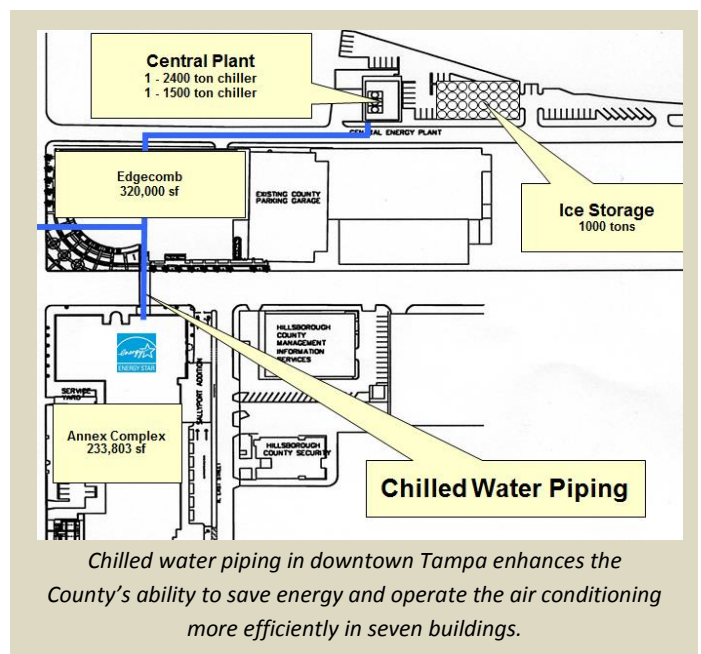
Klindworth maintains a custom template created in Portfolio Manager that he can download into Microsoft Excel, produce a report with a select base year, and compare the current energy use intensity (EUI) to the base and the National Median for buildings with similar functions. Because more than 40 percent of all U.S. commercial building space is already benchmarked in Portfolio Manager, this comparison provides a robust standard against which to pursue energy savings.⁶

Downtown Chilled Water

Another major energy-saving project that gives the county a competitive edge in the 2013 Battle of the Buildings is the Central Chiller Plant that supplies chilled water for air conditioning to five downtown county buildings and two school district buildings (over 1.5 million square feet), including three buildings that are ENERGY STAR certified. The plant was constructed in two phases:

- In 2003, Phase I of the construction of a new court building included building a Central Energy Plant installed with a 2,400-ton chiller.
- In 2004, Phase II added an additional 1500-ton chiller capable of temperatures low enough to make ice was installed with ice storage units.

The addition of the second chiller increased energy savings by enabling the creation of ice during the evening hours when the electric rates are lower, and use of the ice to chill the water during the day. Five buildings supplied by the plant are county buildings, but two additional school district buildings were also connected to the network. This system generates revenue for the county from the sale of chilled water, and the partnership saved construction costs for the schools by eliminating the need for chillers. Combined with other energy saving measures on downtown buildings, such as lighting retrofits, occupancy sensors, and building



⁶<http://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager>.

automated controls and variable speed pumps and fans, the project has led to energy cost savings of \$1,515,849 annually, producing a return on investment of 8.3 years.⁷

Future Plans for ENERGY STAR

By September 2014, Klindworth plans to have all of the county's 300 facilities entered into Portfolio Manager, so he can use the tool to track progress and identify new opportunities for energy savings. Klindworth has reconvened Energy Teams comprised of members from county departments to engage them in incorporating energy saving measures and will be reviewing his reports from Portfolio Manager with them quarterly. Klindworth has also been working with personnel from the City of Tampa on using Portfolio Manager for their facilities. The county's performance in the ENERGY STAR National Building Competition will provide an opportunity to showcase county-wide efforts and highlight the effective partnership with ENERGY STAR that they look forward to maintaining in the future.

For more information about energy efficiency programs in Hillsborough County, visit the Hillsborough County's Energy & Sustainability website:

<http://hillsboroughcounty.org/index.aspx?NID=3240>

⁷http://www.energystar.gov/index.cfm?fuseaction=%20labeled_buildings.showProfile&profile_id=1028240