

Miami Dade County Moving Forward, Sustainable Buildings Program

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ABSTRACT

As a leader in public sector sustainability efforts, Miami Dade County has adopted several measures that directly impact the built environment and promote sustainability throughout its operations. In the past few years, the Board of County Commissioners approved the Sustainable Buildings Ordinance (O-07-65) and its associated implementing order (IO-8-8), which established the Sustainable Buildings Program and required that all new county-owned, county-financed, and county-operated buildings meet the appropriate standard under the Leadership in Energy and Environmental Design (LEED) rating system.

To further support and streamline the Sustainable Buildings Program, the Office of Sustainability (OOS) recently embarked on a project to integrate sustainability into the capital improvements process (S-CIP). The resulting guidelines and recommendations will be incorporated into the Implementing Order (IO 8-8). In addition, OOS has set up S-CIP training modules to acquaint the directors of capital depart-



ments, OCI staff and sustainable buildings committee members with the new S-CIP guidelines.

The Internal Services Department (ISD) trades shop facility is the first facility built under the Sustainable Buildings Ordinance and implementing order mandates to receive LEED certification at the silver level from the U.S. Green Building Council (USGBC). According to the USGBC post-occupancy research, data collected have shown that LEED certified office buildings use an average of 25-30% less energy than conventional office buildings. Thus, a 100,000-sq-ft office building can save over one million dollars and 15 million pounds of CO₂ during its lifetime (20 years). Cumulative to date, there are over 2,000,000 sq ft of new or renovated green space planned for the county that will meet maximum sustainable measures or become certified under the LEED rating system (31 qualifying projects and six additional non-qualifying projects). This translates to energy savings of around \$20,000,000 in the next 20 years and a reduction of around 300,000,000 lbs of CO₂. Some of the upcoming LEED projects include the Marlins Stadium, the Children's Courthouse, the ISD West Lot, the Northeast Library, the Miami Art Museum and the Miami Science Museum.

INTRODUCTION

For the past several years, Miami Dade County has been working on establishing and cultivating sustainability measures within government operations and throughout the county. In fact, Miami Dade County has supported sustainability initiatives for years, dating back to 1982 when they opened one of the most technologically advanced waste-to-energy facilities in the world. To date, Miami Dade County has countless policies and programs meant to enhance the livability of the county. Some of these policies include the Environmentally Endangered Lands Program, the Urban CO₂ Reduction Plan (1993); the Water Efficiency Plan (2006); the single stream recycling program; and the *GreenPrint* Sustainability Plan (2010) for which the county received a sustainability leadership award from ICLEI and the U.S. Green Building Council. Furthermore, Miami Dade County has been a regional and national leader in the realm of sustainability as a founding member of ICLEI, Communities for Sustainability; a member of the Chicago Climate Exchange Pilot Project since 2007; a member of Cool Counties since 2008 where

the county committed to reducing CO₂ emission by 80% by 2050; and through the establishment of the Southeast Florida Regional Climate Change Compact in 2009.

SUSTAINABLE BUILDINGS PROGRAM

As part of the county's efforts aimed at improving the economic, social, and environmental performance of its operations, Miami-Dade's Board of county Commissioners approved Resolution R-1200-05 in October of 2005. The resolution incorporated sustainable development building measures into the design, construction, renovation, and maintenance of county-owned, county-financed and county-operated buildings. In May of 2007, the Board approved Ordinance 07-65, amending Miami-Dade county's code to establish a Sustainable Buildings Program (SBP) for county facilities. It was followed by implementing order 8-8 approved on December 7, 2007, which outlines the mechanism for determining compliance with the Ordinance and departmental responsibilities. Implementing order 8-8 establishes the most current version of the USGBC's LEED rating system as the standard for the planning, design and construction of all new buildings and renovations. To date, there are 31 qualifying projects and six additional (non-qualifying) projects that will meet maximum sustainable measures or become certified under the LEED rating system.

The Sustainable Buildings Program advances a policy of incorporating green building practices into the planning, design, construction, management, renovation, maintenance and decommissioning of County buildings.

Miami Dade County's SBP advances a policy of incorporating green building practices into the planning, design, construction, management, renovation, maintenance, and decommissioning of county buildings. The SBP requires the county to maintain a sustainability manager position to oversee the program. Moreover, it also requires all county capital improvement departments to appoint a staff member to act as a sustainability liaison and establishes the Sustainable Buildings Committee, comprised of the designated liaisons and chaired by the sustainability manager. In light of this, the county created the Office of Sustainability in 2008 to house the sustainability manager. Almost four

years later, the Office of Sustainability (now part of the Sustainability, Planning and Economic Enhancement Department) has grown significantly and with that growth it has amassed many more responsibilities. The additional responsibilities include reducing electricity consumption throughout the county by 20% relative to 2007 levels and, most recently, managing a \$12.5 million Energy Efficiency Conservation Block Grant (EECBG) from the U.S. Department of Energy (DOE) that is currently funding twelve energy efficiency projects within the county.

In addition to these requirements, the county has passed several other energy and climate performance requirements worth noting. In 2009, the Board of county Commissioners adopted Resolution R-228-09, directing the mayor to develop an energy master plan to reduce electricity consumption in county operations by 20% by 2014 relative to a 2007 baseline. Among other elements, the proposed plan included mandatory use of Portfolio Manager for benchmarking facility energy consumption and re-commissioning or retro-commissioning (RCx) of buildings. RCx refers to the process of ensuring that an existing building's performance continues to meet or exceed its design intent over time. On June 22, 2009 the county Manager submitted a memo to the board in response to R-228-09 outlining four major initiatives including: (1) improved analysis of baseline and future energy consumption; (2) use of federal grant funds for energy conservation projects; (3) expanded and enhanced use of energy savings performance contracts (ESPCs), and (4) integration of energy performance into county strategic planning as well as departmental service delivery and performance measures. The energy master plan will be completed before the end of 2011. Furthermore, in 2010, the county adopted Resolution R-1103-10, requiring that energy-efficient reflective roofs or green roofs be specified in all solicitations for construction of new public and affordable housing in the county with a contract value greater than \$1,000,000. Specifications must be based on LEED standards, or standards equivalent to LEED.

SUSTAINABLE CAPITAL IMPROVEMENTS PROCESS (S-CIP)

To strengthen and support the Sustainable Buildings Ordinance and encourage more sustainable building design, construction, and land use, the Office of Sustainability (OOS) recently completed the Sustainable Capital Improvements Process Project (S-CIP). The project was



carried out by consultants from Reynolds, Smith & Hills (RS&H) and resulted in the county's "S-CIP Guidelines & Recommendations Report." It is one of twelve Energy Efficiency Conservation Block Grant (EECBG) projects managed by OOS. The intent of this project was to develop and integrate energy and climate-focused policies and procedures into the county's capital improvement process. RS&H surveyed, interviewed and held workshops with representatives from fourteen capital departments to evaluate their approach to the CIP. They also analyzed current Board of County Commissioners' policies and requirements related to energy and climate performance. Lastly, RS&H compiled CIP best management practices from similar organizations across the country and compared these with the county's existing CIP. Through this exercise, the consultants were able to provide Miami Dade County with a flow chart clarifying which energy and climate performance requirements (LEED, Cool Roofs, Life Cycle Cost Analysis), if any, apply to a given project. Moreover, they created procedural timelines depicting the mandatory steps that need to be taken during the planning, design, and construction phases to achieve compliance with the pre-determined requirements. Lastly, the consultants offered policy and procedural recommendations to further improve the energy efficiency and greenhouse gas (GHG) emissions reduction through the CIP, translating into less energy consumption and operation and maintenance savings for the county.

The county's energy and climate performance requirements apply to capital improvement projects based on specific criteria detailed below. These criteria result in five major capital improvement categories: (1) New building construction, (2) Major building renovation/remodel, (3) Non-major building renovation/remodel, (4) Minor building renovation remodel (or "exempt" building project), and (5) Non-building capital improvement. For each of these categories, different energy and climate performance requirements apply. Figure 1 graphically depicts these differences and provides assistance with determining which category is appropriate for a given project.

1. **New building construction** projects must be formally certified as LEED NC "silver." This requirement does not apply to projects for which a design team was selected before December 14, 2007. All new construction projects are subject to the county's LCC analysis policy. New public and affordable housing projects with a contract value greater than \$1,000,000 must comply with the county's Cool Roof requirements.
2. **Major renovation/remodel** projects must formally attain a LEED NC "certified" rating. Major renovations have a project cost that is equal to or greater than 50% of the building's replacement cost. All major renovation projects are subject to the county's LCC analysis policy.
3. **Non-major building renovation/remodel** projects must formally attain a "certified" or higher rating under LEED NC, LEED for Commercial Interiors (LEED CI) or LEED for Existing Buildings (LEED EB) rating systems. Non-major renovations have a project cost less than 50% of the building's replacement cost, but greater than \$1,000,000. Most non-major renovation/remodel projects will be subject to the county's LCC analysis policy. Only those projects not requiring compliance with the latest edition of the State of Florida Building Energy Code (FBEC) are exempt from the county's LCC requirement.
4. **Minor building renovation/remodel** projects are encouraged to incorporate the maximum feasible number of LEED-approved green building practices. Feasible practices are those that are practical and fiscally responsible. LEED certification is not required for these projects. The same requirements apply to those building

projects deemed exempt from the requirements of the Sustainable Buildings Program. Many minor renovation/remodel projects (as well as projects exempt from the SBP) will be exempt from the county's LCC analysis policy. However, minor renovations that include air conditioning, driers, hot water heaters, light bulbs, vehicles, refrigerators and freezers, among other building systems, are subject to the policy. Exemptions or modifications of the county's standards may be made due to "special circumstances." Exemptions and/or modifications permit use of alternative green building rating standards, but do not exempt use of green building practices to the maximum extent possible. The Sustainability Building Committee is tasked with addressing petitions for exemptions and making recommendations to the sustainability manager regarding appropriate standards.

5. **Non-building capital improvement** projects are not subject to any countywide energy and client performance requirements. However, some departments may have mandated policies or procedures related to energy and/or climate performance.

To facilitate compliance with the different county requirements, each of the categories listed above requires its own administrative procedures. These procedures flow along three compliance paths: (1) Path 1—covers new construction, major renovations and non-major renovations, (2) Path 2—covers minor renovations and exemptions, and (3) Path 3—covers non-building capital improvement projects. For each of these paths, RS&H created procedural timelines depicting the steps that need to be taken during the planning, design, and construction phases to achieve compliance with the requirements. Figure 2 represents the timeline used for the new construction/major & non-major renovation compliance path and the agent responsible for each step.

CASE STUDY

The ISD Trades Shop is the first LEED silver certified facility owned and operated by Miami Dade County. It represents the beginning of a new era in the sustainable construction and green industry for Miami Dade County. The facility is the new headquarters for over 100 employees, including construction managers, carpenters, refrigeration

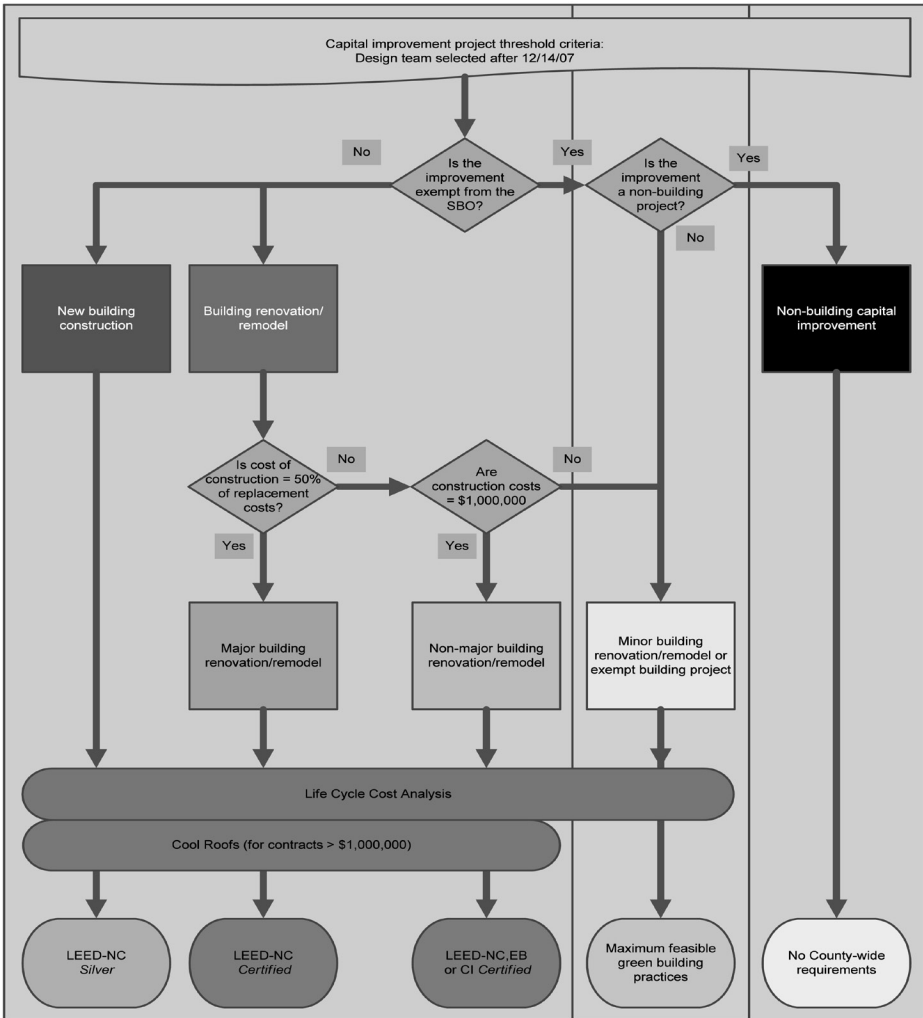


Figure 1: Energy and Climate Performance Criteria and Requirements

mechanics, painters, electricians, and plumbing staff. It also contains office space, a stock room warehouse, a staff training room, record storage, and furniture warehouse. In a property of 5.5 acres, the 100,000sqft facility occupies only 79,000sqft of land and provides parking for 115 vehicles, along with bicycle parking and changing facilities as required by LEED rating system V2.2.

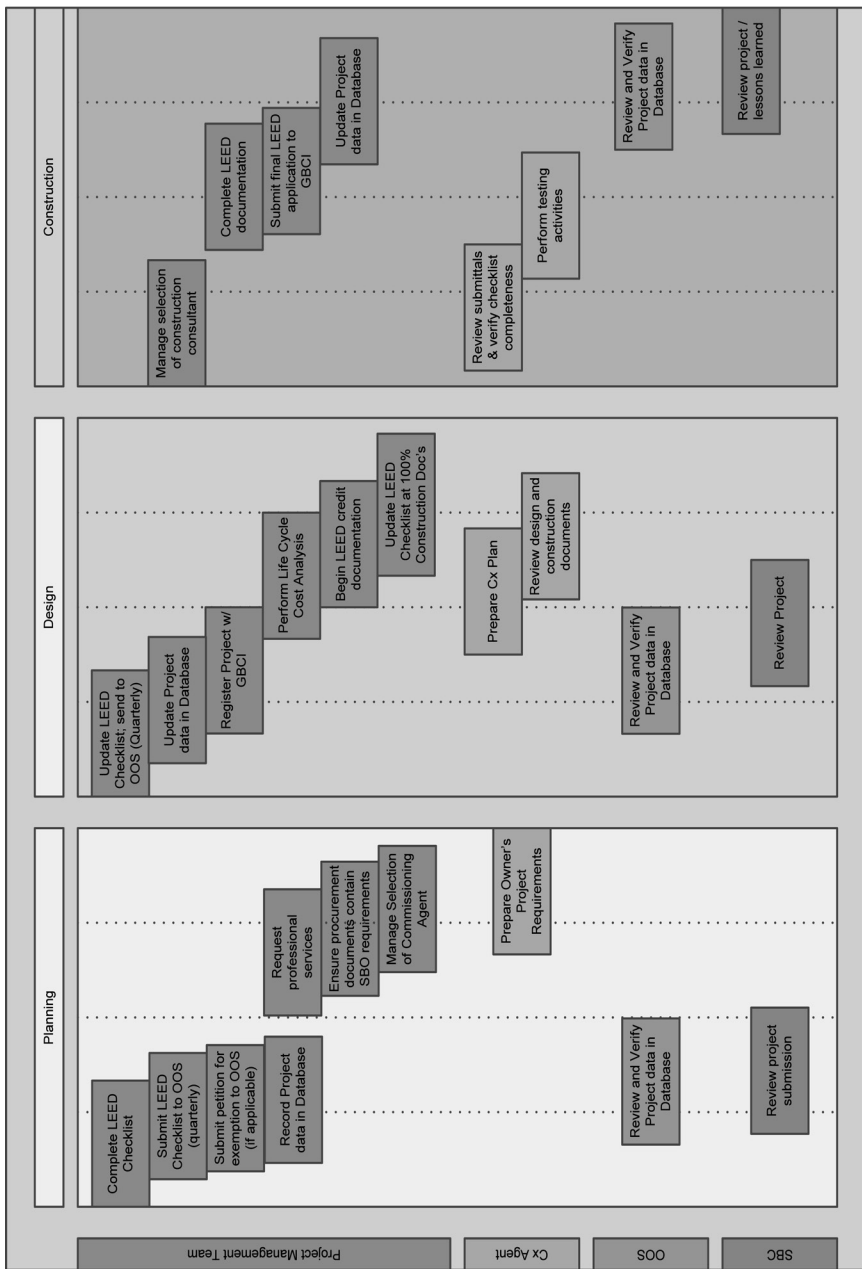


Figure 2: New Construction/Major & Non-Major Renovation Project Flow



One of the main goals for this project was to divert from landfill at least 95% of waste generated during construction. To accomplish this, a special waste management program was implemented. The existing 166,000-sq-ft facility was demolished to build the new one. All concrete from the demolition portion was crushed and used for the new building pad.

A second project goal was to save energy and reduce water consumption. The design addressed energy and water consumption requirements through interior cross ventilation, low-e glazing, sunshades, light shelves, Florida-friendly yards and drought-tolerant plant species, Energy Star cap for roofing, and low flow fixtures. To reduce the energy costs, the designers introduced the cross ventilation system in the warehouse portion of the project, relying on wind to force cool exterior air into the building through louvers located in the lower east side that are opened automatically during the hours of operation. This forces warm interior air out of the building through extractors (fans) located on the upper west side which also open automatically during hours of operation. Having openings on opposing sides of the structure creates a breeze of fresh air through the building. It is estimated that this building will perform 28% better than a standard building, which is equivalent to saving \$76,600 annually.

Other design elements include:

- Window sunshades to prevent direct sunlight most of the day
- Light shelving to allow daylight to penetrate deep into the building
- Skylights within the warehouse to reduce the number of lighting fixtures needed
- Mineral surfacing cap sheet on the roof (Energy Star® qualified, reflectivity 0.80, emissivity 0.90, and SRI 100)
- Low water consumption bathroom fixtures including faucets, toilets, and showerheads
- Irrigation system designed for native species

CONCLUSION

Over the next several decades, it is estimated that as many as three quarters of the buildings in the US will be built or renovated (Mazria, and Kershner, 2008). As a public sector leader, Miami Dade County has the opportunity to build and renovate in a way that will not only save the county and taxpayers money, but also conserve valuable natural resources and protect the region's delicate environment. Through their efforts, Miami Dade County can lead by example and



thus play a key role in developing a prosperous and sustainable future for its residents.

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Patricia Gómez has over fifteen years of public service experience with Miami Dade County. She has experience as a practicing engineer as well as a faculty member with an emphasis on civil and environmental engineering. Most recently, she serves as the Sustainability Program Manager for Energy, Infrastructure & Policy in the county's Office of Sustainability. Previously, Ms. Gómez served as a professional engineer with the Water and Sewer Department. She began her career with Miami Dade County as an engineer with the Department of Environmental Resources Management working on the county's Climate Action Plan. Ms. Gómez holds a master's degree in environmental engineering and a bachelor's degree in chemical engineering. In addition, Ms Gómez is a LEED AP BD+C accredited professional, a Certified Energy Manager and a professional engineer in the state of Florida.

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