Miami-Dade Sustainable Development and Building Code Project

Code Diagnosis Report and Priority Recommendations



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Prepared for:
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Executive Summary

PROJECT OVERVIEW

Miami-Dade County is a recognized leader in Florida and nationally regarding sustainability planning and implementation. It has undertaken many initiatives to address climate change and encourage more sustainable building design, construction, and land use including:

- Creating an Office of Sustainability to spearhead sustainability initiatives,
- Enacting an expedited permitting system for green building projects,
- Developing the countywide *GreenPrint* sustainability plan as guidance to assess sustainability challenges, evaluate programs and initiate solutions,
- Updating the county comprehensive development master plan and zoning code to integrate climate change and energy conservation goals, and
- Taking steps to create alternative energy financing systems.

Now, under the direction of the Office of Sustainability, Miami-Dade County has undertaken a timely and exciting initiative, the "Sustainable Development and Building Code Project", to evaluate and incorporate sustainability provisions into its development regulations (zoning, subdivision, etc.) and building codes. The project is funded by a federal Department of Energy (DOE) Energy Efficiency Conservation Block Grant (EECBG). Miami-Dade is looking to expand its current efforts to encourage more sustainable building design, construction, and land use in the larger community and focus specifically on energy efficiency, greenhouse gas reduction, and the use of renewable energy systems. Doing so will not only advance the County's ambitious sustainability objectives but also help it meet the goals of the Cool Counties Resolution which it has signed, and comply with recently adopted state legislation (HB 697 and HB 7135).

Miami-Dade has retained a team led by Clarion Associates, a national land use planning and zoning firm, to assist in this effort. The team includes the architectural and land use planning firm of Farr Associates and sustainable building code specialists, Development Center for Appropriate Technology.

MAJOR THEMES

Four major themes emerged from stakeholder interviews and discussions with county staff conducted as part of the project initiation phase:

1. ***Build on what's already been done***—Many stakeholders noted that the county has numerous other efforts and initiatives underway (or that were recently completed) in support of its sustainability policies. While this effort is focused solely on sustainability as it relates to the county's development and building codes, a clear understanding of recent and parallel efforts is

necessary to help shape the recommendations contained in this diagnosis and are noted where applicable.

2. ***Streamline the process***—A number of stakeholders expressed concern about the lack of predictability in the development review process and the length of time needed to process "green" projects that may not be consistent with the requirements of the development or building codes--but are consistent with the county's sustainability goals. While they acknowledged that the county has a variety of tools intended to help provide flexibility and opportunities for alternative approaches (e.g., Planned Developments and Planned Area Development District, creation of a development coordinator in the county executive's office, expedited green building code review process) there was consensus that more could be done generally in the development review process to help encourage more creative and sustainable building and development practices. Interviewees reflected that the problems they perceived did not seem to be centered entirely on the building or planning and zoning departments, but elsewhere in the system. Though the existing approvals process includes designated maximum times for each approval process, and there is an existing expedited process for green plans, there were suggestions that all departments needed to be formally included in the expedited process. Additionally, it seems likely that there may be approval delays caused by agencies at the state or federal level that are beyond the control of the county. Improving available information and communication about the full range of required approvals for a project, including those which are beyond the county's control could help to address this issue. Beyond that, the county could consider adoption of voluntary, incentivized "stretch" or "reach" codes to better enable and encourage higher-performance and energy efficient projects.

3. ***Incorporate new requirements, but offset with incentives and flexibility***—Stakeholders acknowledged that in many instances, new requirements would be needed in the zoning code to address sustainable development practices such as outdoor lighting; however, it was noted that flexible requirements and/or incentives were preferable to allow applicants to address a particular requirement in the most cost efficient and practical manner for each project. In addition, it was noted that many sustainable technologies (e.g., solar, wind) are advancing and changing very rapidly and that some flexibility should be built into the development and building codes to allow for administrative approval of new materials and technologies that are equal to or better than what's actually required as these opportunities arise.
4. ***Focus on infill and redevelopment as well as new development***—It is widely recognized that Miami-Dade County is basically built out with few vacant large parcels available for development within the urban development boundary. Consequently, stakeholders urged that the county concentrate on promoting sustainable infill and redevelopment. A particular challenge noted by stakeholders was that, with the exception of special areas like the Urban Centers Districts, the development codes generally apply the same requirements (parking, landscaping, open space) to the adaptive reuse of an existing building and infill development as it would to an undeveloped site. It was noted that this one-size-fits-all approach may reduce the viability of reuse and revitalization on many of the county's more challenging development sites.

In addition to the overarching themes outlined above, detailed recommendations related to each sustainability topic also emerged. These more topic-specific recommendations have been incorporated, as appropriate, throughout this diagnosis.

RELATED EFFORTS UNDERWAY

Countywide Sustainability Initiatives

In addition to this Sustainable Development and Building Code Project, the county has many other current sustainable policies and programs in place or underway and has supported sustainable initiatives for years. The following is a list of some of the more notable sustainable programs the county has initiated or joined in:

- In 1982 opened one of the most technologically advanced waste-to-energy facilities in the world.
- Environmentally Endangered Lands Program approved by Miami-Dade Voters.
- Founding member of ICLEI, Communities for Sustainability, an international organization supporting climate protection and sustainability.
- Adopted Urban CO2 Reduction Plan in 1993.
- In 1999 adopted the innovative Downtown Kendall Urban Center zoning district that included numerous provisions to encourage infill development. This was followed by amendments to the zoning code creating the Standard Urban Centers District that further promote infill and redevelopment in key areas of the county.
- In 2003 purchased first hybrid fleet vehicles.
- County commissioners establish Climate Change Advisory Task Force and adopt water efficiency plan in 2006.
- In 2007 joined the Chicago Climate Exchange Pilot Project and adopted the Sustainable Buildings Ordinance.
- Created the Office of Sustainability in 2008 and joined Cool Counties, committed to reducing CO2 emission by 80% by 2050. Also implemented a single-stream recycling program.
- Established the Southeast Florida Regional Climate Change Compact in 2009 and replaced 75,000 traffic signal bulbs with LED modules, saving $2 million.
- In 2010 released the *GreenPrint* sustainability plan. Received sustainability leadership awards from ICLEI and the U.S. Green Building Council.

Zoning Code Rewrite Project

Concurrent with the Sustainable Development and Building Code Project, the county also has underway a broader zoning code rewrite project. The general purpose of that effort is to reorganize the code into a more logical, simple, and user-friendly format, create new zone districts based on the comprehensive development master plan, to rely more on tables, graphics, and illustrations, and to blend in guidelines from the county Urban Design Manual. Details can be found under the zoning tab on the county Department of Planning and Zoning web site. Members of the Sustainable Development and Building Code Project have met with Planning and Zoning Department staff to discuss both efforts. The outcome of this project can be used to advise and complement the zoning code rewrite project by utilizing specific recommendations that can help address the county's sustainability, energy, and climate change goals.

SUMMARY OF RECOMMENDED CHANGES

Overview

The scope of this Development and Building Code review focuses on three main topics: (1) Energy Efficiency and Energy Conservation, (2) Greenhouse Gas Reduction and Climate Change, and (3) Renewable Energy. Because we heard many comments about the county's development review and approval process, we have included a separate chapter addressing that important topic. For each topic, the Diagnosis addresses the following:

1. ***Current county regulations*** relevant to each topic;
2. Potential ***barriers*** in the development and building codes as well as other selected sections of the county code related to each topic and possible revisions to remove those barriers;
3. Potential ***incentives*** for consideration to encourage energy efficiency/conservation, greenhouse gas emission reductions, and renewable energy;
4. Specific ***recommendations to fill regulatory "gaps;"*** and
5. Examples of **best practices** and trends from progressive communities throughout the nation.[1]

Although the focus of this diagnosis is on the zoning code (Chapter 33 of the County Code) and building code (Chapter 8), a number of the county's current regulations related to the three key sustainability topics are not located in the zoning code but in other chapters of the county code such as the landscape ordinance (Chapter 18A), subdivision regulations (Chapter 28), historic preservation ordinance (Chapter 16A), tree removal (Chapter 24), floodplain regulations (Chapter 11C), and solid waste management provisions (Chapter 15). Therefore, these other sources are cited and evaluated, as appropriate, in addition to the zoning code in the inventory of current regulations provided for each topic.

In addition to the three main topics, we have also addressed related sustainability topics in each section such as water conservation (closely related to energy conservation), recycling (related to greenhouse gas reductions), and housing (accessory dwelling units are related to greenhouse gas reductions).

As part of the project scope, the consultant team also interviewed four developers and tested their "green building" projects to understand the on-the-ground ramifications of Miami-Dade County's existing development and building codes. Additionally, the interviews allowed the consultant team to verify whether the findings in the Diagnosis were borne out in actual practice. Testing the projects in this way provided a practical perspective about the realities of development in Miami-Dade County. The developers were chosen, with staff assistance, because they have completed green buildings or projects in the County and could provide useful feedback regarding the strengths and weaknesses of the existing development and building codes. The Diagnosis includes a summary of those interviews, particularly as they relate to its major findings, as well as the responses from the County staff after reviewing an initial draft of the project testing report. Overall, the testing confirmed some of the key observations in the

[1] Based on discussions with staff, the consulting team paid particular attention to practices adopted in Seattle, WA, Portland, OR, Salt Lake City, UT, Sarasota County, FL, Washington, D.C., Miami, FL, Cascadia Green Building Council, WA, Tucson/Pima County, AZ, Roswell and Atlanta, GA, The consulting team also included recommendations from the Rocky Mountain Land use Institute's Model Sustainable Development Code and reports from the U.S. Green Building Council and the U.S. EPA Sustainable Communities Office.

Diagnosis and revealed other issues the County should consider in evaluating potential development code amendments.

One of the most challenging aspects of the project with respect to the county's building code is that the state has adopted legislation that prohibits the county from adopting energy-related building code regulations and standards that are either stricter or more lenient than the state building energy code. The county thus has very little leeway when it comes to adopting energy-related building code provisions.

Due to the interrelated nature of a number of the three key topics addressed in this diagnosis (for example energy conservation and greenhouse gas reduction), some overlap between the analysis of current regulations and recommendations occurs between topics. This redundancy has been retained to ensure that each topic may be reviewed independently, if desired. A brief summary of recommendations by topic is provided below.

Energy Efficiency and Energy Conservation

The United States uses significantly more energy per capita than any other nation in the world, the U.S. Department of Energy reports that more than 85 percent of the energy consumed in the United States comes from fossil fuels—coal, oil, and natural gas. This includes nearly two-thirds of our electricity and virtually all of our transportation fuels. Energy generation from fossil fuels is the single largest contributor to greenhouse gas emissions, which have been linked to global warming and health impacts from air pollution. Additionally, over 63 percent of all oil that the nation uses is imported, a trend that has fueled serious national security concerns.

According to the county's recently released *GreenPrint* plan, most of the fuel emissions from Miami-Dade County come from the use of electricity (51%) and unleaded gas (37%). Florida Power and Light (FPL) is the county's main electricity supplier, and it uses primarily natural gas (75.5%) and nuclear power (12%) to produce electricity. The rate of increase in Miami-Dade County's electricity use is outpacing that of its population growth. This trend appears to have leveled off in the last few years, and the good news is that county residents have substantially reduced their use of water—over 28 million gallons a day which saves huge amounts of electricity that would be necessary to move and treat that water.

Miami-Dade County has adopted numerous policies and programs aimed at supporting energy efficiency and conservation. Moreover, recognizing the importance of stepping up energy efficiency and conservation efforts to reduce fossil fuel use and greenhouse gas emissions, Miami-Dade County has established some ambitious goals in *GreenPrint*:

- Reduce per capita non-renewable energy use to 20 percent below the 2007 baseline by 2015;
- Reduce water consumption by an additional 1.5 million gallons a day; and
- Reduce government electricity use by 20 percent from 2007 to 2014 in accordance with Board of County Commissioners legislation.

The county already has many other energy efficiency and conservation initiatives underway to reach these goals ranging from educational programs to demonstration projects.

It is ahead of many communities in Florida and nationally when it comes to pushing energy efficiency and conservation policies, programs, and legislation. The county has already adopted a number of

amendments to its development codes to promote energy efficiency and conservation such as the zoning codes Urban Centers Districts that promote mixed-use developments which can reduce vehicle miles traveled and use of gasoline. It has also recently revamped its landscape ordinance that promotes the use of water-efficient landscaping to reduce energy use. However, there is still much more that the county can do with its development and building codes to increase energy efficiency and support energy conservation such as:

- Removing barriers to and creating incentives for green/cool roofs by encouraging the development of green roof standards appropriate for high-wind locales, adopting the latest standards when available, and approving demonstration projects and innovations when they are technically feasible;
- Adopting energy-efficient outdoor lighting regulations that minimize the amount of light produced and energy use;
- Establishing water budgets for multi-family, commercial, and industrial users and efficiency standards for irrigation systems;
- Permitting harvested rainwater to be used for non-potable indoor uses such as toilet flushing;
- Permitting accessory dwelling units in more zone districts to provide affordable housing close to jobs and transit;
- Allowing nonconforming uses to be modified or expanded if sustainable facilities and systems are put in place;
- Improving enforcement of existing energy codes; and
- Creating an incentive system for developers to voluntarily exceed the state building code's energy efficiency provisions by tying the county's current expedited green building permit system to the International Green Construction Code (IGCC), a locally developed "stretch" code, or installation of energy-saving features such as solar thermal equipment.

Greenhouse Gas Reduction and Climate Change

Miami-Dade County has been a long-time leader among local governments in the United States in its efforts to reduce greenhouse gas emissions that contribute to climate change. Climate change is increasingly being accepted as a scientific fact that will require communities to create policies and solutions to address the problem. Tangible evidence seems to be accumulating on an almost daily basis—shorter winters, melting polar ice caps, extreme storms, rising sea levels, and deeper droughts.

Greenhouse gases (GHGs), with their undisputed heat-trapping properties, are increasingly linked to and seen as the leading cause of global warming. GHGs are primarily made up of carbon dioxide, methane, nitrous oxides, and chlorofluorocarbons. The bulk of greenhouse gases emitted in the U.S. are associated with fossil-fuel burning electricity generation (34%), transportation (27%), and industrial fuel use (14%). Buildings account for about 37 percent of total U.S. energy consumption and approximately 70 percent of electrical consumption. According to the 2010 draft county comprehensive development master plan Evaluation and Appraisal Report (EAR), Miami-Dade County's CO2 emissions in 2005 were about 31.9 million tons, an annual increase of 8.5 million tons or 36.5% since 1988. The county's population grew only by about 27% during this period. Per capita CO2 emissions increased by 8 percent over this same period. Not surprisingly, the 2010 draft EAR identified climate change as one of the four

major pressing issues that had to be addressed in the updated comprehensive development management plan which guides future growth and development in the county.

One of the first jurisdictions nationally to take seriously the potential impacts of climate change, Miami-Dade County has for many years been dealing with the issue and greenhouse gas emissions. In 1993 the county adopted its Urban CO2 Reduction Plan which has successfully reduced carbon dioxide (CO_2) emissions by about 34 million tons by 2005.[2] Importantly, the recently adopted *GreenPrint* document has embraced even more ambitious goals related to climate change:

- Stop increasing GHG emissions by 2010 and achieve a 10% reduction every five years after that through 2010.
- Reduce electricity use in internal county operations by 20 % of 2007 levels by 2014.
- Plant half a million trees by 2015 to achieve a 30 percent tree canopy by 2020 and encourage native, drought tolerant landscaping to cool our communities, capture greenhouse gas emissions, beautify our neighborhoods, and provide wildlife habitat.

Development and building codes have a critical role to play in helping the county reach its greenhouse gas reduction goals. The development and building code strategies for greenhouse gas reductions addressed in this section fall into three main categories:

1. Reducing, reusing, and recycling of wastes, thus reducing methane gas and carbon dioxide production. Specific recommendations include, for example, requiring construction waste management plans for new developments.
2. Promoting compact, mixed-use development patterns and infill and redevelopment leading to less auto-dependent mobility and reduced vehicle miles traveled. This can be done in a number of ways, for example, by revamping the county's development standards for parking, landscaping, and open space that are currently geared for suburban development patterns.
3. Preserving existing trees and planting new trees and other vegetation that can sequester CO2, thereby cleaning the air of major GHGs. The county has a number of tree protection regulations that can be better tailored for application in redevelopment and infill areas.

Renewable Energy

Renewable energy production has been a hot topic for many communities around the nation as concern has grown about the dependence of the country and many local economies on fossil fuels – coal, oil, and natural gas. The U.S. Department of Energy reports that more than 85 percent of the energy consumed in the United States comes from fossil fuels – that is nearly two-thirds of our electricity and virtually all of our transportation fuels. Energy generation from fossil fuels is the single largest contributor to greenhouse gas emissions, which have many negative impacts on the environment. And, from a global perspective, the U.S. generates 25 percent of global greenhouse gas emissions while only comprising four percent of the world's population. In addition, to substantial environmental benefits, renewable energy can enhance the nation's energy security.

Renewable energy, such as wind, sun, geothermal, and biofuels, is becoming a more viable source for power as technology advances. In the U.S. only about 10 percent of energy is generated from

[2] http://www.miamidade.gov/PlanZone/ear2010/library/2010EARChapter1Draft.pdf, Draft 2010 EAR

renewable sources and only about 0.1 percent from solar. However, the amount is projected to increase rapidly as oil prices continue to increase—some experts estimate that by 2015 the cost of solar will be on part with the cost of fossil fuel and that by 2025 it will be cheaper.

Just a few years ago, Florida was at the forefront of the solar power movement, ranking third in total grid-connected solar capacity in 2009. It has since fallen to fifth place in 2010, and it is behind at least seven states in terms of photo-voltaic solar system orders for the 2010-2014 period. Similarly, at one time many homes in South Florida used solar thermal equipment to provide hot water, but…

Florida generally has less potential for use of other types of land-based renewable energy systems. According to federal sources, its wind and geothermal potential are modest at best. In Miami-Dade County, electricity and transportation are responsible for 92 percent of all emissions. Florida Power and Light (FPL), owning and operating two power plants in the county, provides most of the electricity for Miami-Dade County. It primarily uses natural gas (75.5%) and nuclear power (12%) to produce electricity. Only 0.1 percent of its power comes from renewable sources—solar. According to *GreenPrint*, the rate of increase in Miami-Dade County's electricity use is outpacing that of its population growth.

Miami-Dade County has adopted a number of policies and programs and undertaken demonstration projects aimed at supporting renewable energy generation. For example, the county is working towards a goal of reducing government electricity use by 20 percent from 2007 to 2014 in accordance with legislation adopted by the board of county commissioners.

Although Miami-Dade County has taken a number of important steps to promote renewable energy sources, many observers believe much more could be done to promote renewable energy use, especially solar. Knowledgeable stakeholders who were interviewed as part of this project cited administrative and procedural issues in the permitting and product approval processes for solar energy systems as hurdles to increased use of solar systems—and these issues are addressed in the chapter of the report that follows (*Permitting/Plan Review/Inspection Process).* Additionally, there are some important opportunities to revise the county's development codes to foster increased use of renewable energy systems such as:

- Clarifying zoning code provisions applicable to renewable energy generation (e.g., zone district and use regulations) to more explicitly address appropriate locations and standards for the full range of renewable energy facilities;
- Revamping existing strict non-conforming use/structure regulations to encourage redevelopment and alternative energy retrofits of existing buildings;
- Preserving solar access to properties and protecting solar access of installed solar systems; and
- Requiring a minimum amount of energy in new developments come from renewable energy sources.

Permitting/Plan Review/Inspection Process

As discussed in the introduction to this diagnosis, the primary focus of this project is on substantive changes that can be made to the county's development and building codes to promote county sustainability goals in three main areas: energy efficiency and conservation, greenhouse gas reduction, and renewable energy. The preceding sections of the diagnosis have identified numerous changes, both major and minor, that the county should consider.

However, in the course of interviewing county staff and stakeholders who have hands-on experience with the county development and building review process, we heard loud and clear that development procedural and permitting issues were every bit as important as substantive changes to the development and building codes. Interestingly, we heard that the most significant procedural snags in the system were often not in the zoning and building code review areas. Indeed, the planning and zoning department staff were commended by many in the development community for being flexible in working with applicants to promote "green" sustainable projects. This issue is not news to county staff. Over five years ago the county created a development coordinator's position in the county's manager office in response to a study of the development review process. The development coordinator assists applicants to navigate the review process, helps facilitate large projects (e.g., the Florida Marlin's new stadium), and works to ensure a customer-friendly land use and building approval process. The set of flow charts developed for this process are among the most thorough and comprehensive we have seen, enabling a more systemic approach to approvals than most jurisdictions. The county by ordinance has also established maximum review times for all projects.

Because the consulting team feels that these development review process and permitting issues are important for the county to address on an equal footing with our recommended substantive changes, we have added this section to the Diagnosis. We have broken down our observations and recommendations into seven broad categories:

1. Solar system permitting
2. Expedited green permit process
3. "Green Building" education of plan reviewers, inspectors, and contractors
4. County/State product testing
5. Actual versus designed green buildings
6. Living building challenge option
7. Zoning code public participation

Some of the recommendations we have made include:

- Creating a separate, standard package of building code requirements for solar systems,
- Better publicizing the county's expedited green building permit process and making it applicable to more departments,
- Applying the expedited green building permit process to tenant improvements and using it as an incentive for developers to exceed the state building code's energy efficiency standards,
- Inspecting and certifying that approved "as designed" green building energy features actually get installed, and
- Conducting workshops with community councils to provide information on the county's sustainability goals and revamped zoning code provisions related to promoting sustainable projects.

PRIORITY RECOMMENDATIONS SUMMARY

Following completion of the Diagnosis, County staff reviewed the numerous recommendations for development and building code amendments made by the consultants. The goal was to winnow the suggestions in the Diagnosis into a list of priority amendments. This list is intended to inform and guide the County's project implementation efforts.

The County staff ranked each recommendation on a scale of one to five, five being the highest priority. Criteria for a higher score included:

- Whether there was an immediate need for the code change;
- The amendment represents a quick success opportunity that should be pursued; and
- The amendment will result in energy savings/efficiency or greenhouse gas emission reduction.

The rating scores are as follows:

5: Proceed—appears to be ready to be drafted into code change;

4: Even though appears to be ready, not the highest priority;

3: Consider after more research—it may be a good idea, but more information may be useful before putting in time to create a text amendment;

2: It needs additional work/changes before can be implemented;

1: Postpone—it may be an area that is complicated or a low priority for this project right now.

The priority recommendations are listed into three sections corresponding to the three major section of the Diagnosis: Energy Efficiency, Greenhouse Gas Reductions, and Renewable Energy. Within each section, the priorities are three categories: Remove Barriers, Create Incentives, and Filling Regulatory Gaps. This summary lists only the highest priorities identified by County Staff. The final section of this document sets forth the entire list of Diagnosis recommendations and ratings by County staff.

Diagnosis

OVERVIEW

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In addition to the three main topics, we have also addressed related sustainability topics in each section such as water conservation (closely related to energy conservation), recycling (related to greenhouse gas reductions), and housing (accessory dwelling units are related to greenhouse gas reductions).

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regulations and standards that are either stricter or more lenient than the state building energy code. The county thus has very little leeway when it comes to adopting mandatory energy-related building code provisions.

Due to the interrelated nature of a number of the three key topics addressed in this diagnosis (for example energy conservation and greenhouse gas reduction), some overlap between the analysis of current regulations and recommendations occurs between topics. This redundancy has been retained to ensure that each topic may be reviewed independently, if desired. A brief summary of recommendations by topic is provided below.

ENERGY EFFICIENCY AND CONSERVATION

Introduction

The United States uses significantly more energy per capita than any other nation in the world, the U.S. Department of Energy reports that more than 85 percent of the energy consumed in the United States comes from fossil fuels—coal, oil, and natural gas. This includes nearly two-thirds of our electricity and virtually all of our transportation fuels.

A green roof on a Miami parking garage.
Photo Credit: http://urbangreens.tumblr.com/

Energy generation from fossil fuels is the single largest contributor to greenhouse gas emissions, which have been linked to global warming and health impacts from air pollution. Additionally, over 63 percent of all oil that the nation uses is imported, a trend that has fueled serious national security concerns. The cost of energy is also starting to rise again as the world recession ends and demand for all types of fossil fuel begins to rise—and the impacts will be felt most acutely by lower-income households and working people. Fortunately, energy efficiency and conservation offer some important avenues to reduce energy consumption dramatically. Energy conservation techniques—taking actions to reduce energy use—are showing great results already in many communities. Similarly, energy efficiency efforts—getting the most productivity out of each usable unit of fuel—are already offering substantial returns.

According to the county's recently released *GreenPrint* plan, most of the fuel emissions from Miami-Dade County come from the use of electricity (51%) and unleaded gas (37%). Florida Power and Light (FPL) is the county's main electricity supplier, and it uses primarily natural gas (75.5%) and nuclear power (12%) to produce electricity. Its Martin County power plant, which burns gas and oil, is reportedly the single largest fossil fuel-burning power plant in the United States. FPL is currently constructing an even larger plant in northern Palm Beach County in the Everglades Agricultural Area. FPL is constructing three major solar energy projects throughout the state that it states will prevent emissions of more than 3.5 million tons of greenhouse gases (the equivalent of 25,000 cars annually).

According to *GreenPrint*, the rate of increase in Miami-Dade County's electricity use is outpacing that of its population growth. Between 2000 and 2007, per capita electricity use increased due in significant part to increased development square footage, demand for air conditioning, and the growing use of home appliances like large screen televisions. This trend appears to have leveled off in the last few years, and the good news is that county resident's have substantially reduced their use of water—over 28 million gallons a day-- which not only sustains the Biscayne Aquifer (the county's main water source) and protects natural resource areas, but also saves huge amounts of electricity that would be necessary to move and treat that water.

Current Policies and Programs

Miami-Dade County has adopted numerous policies and programs aimed at supporting energy efficiency and conservation. Moreover, recognizing the importance of stepping up energy efficiency and conservation efforts to reduce fossil fuel use and greenhouse gas emissions, the Miami-Dade County

Board of County Commissioners has established some ambitious goals as detailed comprehensively in *GreenPrint*:

- Reduce per capita non-renewable energy use to 20 percent below the 2007 baseline by 2015;
- Reduce water consumption by an additional 1.5 million gallons a day; and
- Reduce government electricity use by 20 percent from 2007 to 2014 in accordance with Board of County Commissioners legislation.

The county already has many other energy efficiency and conservation initiatives underway, including:

- The Energy Efficiency Campaign which includes educational opportunities, product give-a-ways/discounts, and conservation challenges with the hopes of creating long-term behavioral changes toward energy conservation.
- Free electricity usage monitors can be checked out from the library for residents to measure home appliance energy usage.
- County policy requires that new county-owned building projects be certified at the LEED silver level.
- A series of Rain Barrel Workshops that are geared to further reducing use of treated water are available to residents from the Miami-Dade County Cooperative Extension Service.
- The Department of Solid Waste Management offers recycling services to unincorporated Miami-Dade County residents, as well as 20 municipalities, totaling more than 340,000 homes.[3] In 2009 the county recycled approximately 21 percent of its waste which results in substantial energy savings.[4] Late in 2010, the county acquired a hybrid hydraulic diesel waste collection vehicle and will be getting 5 more.
- The Draft 2010 Evaluation and Appraisal Report on the county's Comprehensive Development Master Plan suggests adding new policies such as establishing a Climate Change Checklist that would be used to evaluate the sustainable elements of the proposed development or redevelopment and requiring energy efficiency and conservation as well as the use of renewable energy resources in housing design and developments.
- The county has adopted numerous amendments to its development codes (e.g., zoning) to promote mixed-use and transit-oriented development that can reduce vehicle miles traveled and associated energy use.
- The county adopted an urban growth boundary in 1988 that has helped restrict sprawl and concentrate development in already build-up areas where infrastructure is available. It has adopted and rezoned six urban centers since 2003; these centers have dramatically increased housing densities compared to prior zoning. This helps reduce vehicles miles traveled and supports transit.
- In 2009 Miami-Dade County joined three other counties in the Southeast Florida Regional Climate Change Compact to collaborate regionally on dealing with the impacts of climate change and lessening the causes. The four counties meet each year to work together on a climate change strategy for the region.

[3] http://green.miamidade.gov/recycling.htm
[4] *GreenPrint*

Next Steps: The Role of Development and Building Codes

Miami-Dade County is ahead of many communities in Florida and nationally when it comes to pushing energy efficiency and conservation policies, programs, and legislation. The county has already adopted a number of amendments to its development codes to promote energy efficiency and conservation such as the zoning codes Urban Centers Districts in the zoning code that promote mixed-use developments which can reduce vehicle miles traveled and use of gasoline. It has also revamped its landscape ordinance that promotes the use of water-efficient landscaping to reduce energy use. However, there is still much more that the county can do with its development and building codes to increase energy efficiency and support energy conservation such as:

- Removing barriers to green/cool roofs;
- Adopting energy-efficient outdoor lighting regulations that minimize the amount of light produced and energy use;
- Establishing water budgets for multi-family, commercial, and industrial users and efficiency standards for irrigation systems;
- Promoting mixed-use developments and infill outside the designated urban centers to help reduce vehicle miles traveled and use of gasoline;
- Adopting transportation demand management requirements for large employers and institutions to reduce vehicle miles traveled;
- Permitting accessory dwelling units in more zone districts to provide affordable housing close to jobs and transit;
- Allowing nonconforming uses and structures to add green building features (solar, recycling, etc.) without having to bring entire use or structure into conformity if degree of nonconformity is not increased; and
- Clarifying historic building regulations to ensure solar systems are not precluded.

Current Regulations

The following table cites some of the main current regulations in the county's development and building codes related to energy efficiency and conservation. It is not meant to be all-inclusive, but to highlight some of the key provisions currently on the books that are directly related to this topic. Additionally, similar measures are set forth in the sections on Alternative Energy and Greenhouse Gas Reduction that are closely related topics.

REGULATIONS ADDRESSING ENERGY EFFICIENCY AND CONSERVATION	
COUNTY CODE REF.	**REGULATION**
ZONING CODE	
33-1	**Definitions/Accessory Dwelling Units—**"Accessory building" defined to include "secondary residence." Secondary residence not defined and no general standards in zoning code regarding size, design, etc. Secondary residences not allowed in single-family zone districts.

REGULATIONS ADDRESSING ENERGY EFFICIENCY AND CONSERVATION	
COUNTY CODE REF.	**REGULATION**
33-4.1	**Outdoor Lighting**—Provides minimal "first generation" lighting code standards related to glare and light trespass, but does not address energy usage and efficiency standards to reduce energy use and protect the night sky.
33-35	**Nonconforming Uses**—Strict nonconforming use and structure regulations do not allow any expansion of nonconforming uses or structures even if do not increase degree of nonconformity. May hinder rehabilitation and installation of energy efficiency/conservation measures in older non-conforming structures and uses.
33-122 et seq.	**Off-Street Parking—**Off-street parking requirements are geared primarily for suburban scale development and are generally excessive for infill and redevelopment projects. No general parking reductions for development near transit or for mixed-use projects or parking maximum. More modern parking regulations found in Urban Center Districts. ▪ Section contains minimal bike parking requirements focusing on number of spaces and location. (33-122.3) ▪ No transportation demand management requirements.
33-193 et seq.	**Workforce Housing Program—**Generally sets standards for inclusion of workforce housing in new residential developments. Promotes energy conservation by providing housing for workers close to jobs or transit thereby reducing vehicle miles traveled.
33-284.10 and 284.24	**Planned Development and Planned Area Development Districts—**Contain general reference to energy conservation in review criteria: "Design methods to reduce energy consumption shall be encouraged. Energy conservation methods may include…natural ventilation of structures, siting of structures in relation to prevailing breezes and sun angles, insulation of structures, use of landscape material for shade, direct of breezes and transpiration." No guidance in county's urban design manual on such "design methods." No mention of renewable energy incentives or requirements. Three acre minimum may limit use for infill and redevelopment sites which are often smaller. According to staff, for a variety of reasons neither of these districts have been widely used by developers.
33-284. 86.G	**General Requirements, Street Lighting**—Required in the urban centers and is specified to be 18 feet in height, pedestrian scale, and spaced no less than 60 feet apart. Lighting can enhance the quality of the space and encourage pedestrian use, but additional specifications regarding lumens, wattage, and style of light could be geared more towards energy efficiency and conservation. Cobra head lights are not permitted. Note that Chapter 8C of the County Code relating to building security addresses parking lot lighting levels.
33-284. 33 B.6 & C.8	**Office Park District, Site Plan Review**—Requires the demonstration of specific methods used to conserve energy and provides some specific techniques as natural ventilation, orientation to breezes and sun angles, structural insulation, and landscaping for shade. While methods are asked to be shown on site plans and are encouraged, no specific standard is required to be met. According to staff, the Office Park District has not been widely used by developers.

REGULATIONS ADDRESSING ENERGY EFFICIENCY AND CONSERVATION	
COUNTY CODE REF.	**REGULATION**
33-207.2.1	**Limited Apartment House District, Site Plan Review**—Requests, but does not require, site plan design methods used to conserve energy.
Misc.	**Site Plan Review Criteria (most zone districts)**—Landscaping to be preserved in natural state by minimizing tree removal. Landscape "shall be used to shade and cool, direct wind movements…" However, no specific design standards or guidelines.
33-284. 57A5	**Downtown Kendall Urban Center**–Any site or building design methods used to conserve energy should be included on a site plan. Showing energy conserving design is not required. Regulations require that each building dedicate a specific location for recycling separation, storage, and access. (33-284.62.B.2.J)
33-266, 278,	**Industrial Districts, Site Plan Review** –Applicants requested to "consider" requirements of Chapter 52 of the South Florida Building Code for increasing building energy efficiency.
33-284.87	**Urban Center District Regulations**–The Standard Urban Center District and other Urban Center Districts contain numerous progressive standards and regulations to promote mixed-use development and alternative forms of transportation (walking, bikes, etc.), thus reducing vehicle miles traveled and associated energy use. ▪ Also require that site plans show any site or building design methods used to conserve energy. However, no standards set forth to assess such measures. ▪ Tree requirements are 16/net acre which is a substantial reduction from normally required 28 acre for planned developments and in many non-residential districts. ▪ On-street parking counts towards parking requirements, thus promoting denser, more compact developments. Other alterative parking requirements also provide flexibility and reduce over-parking of sites. Promotes energy-efficient infill development. ▪ Street lighting standards do not address energy efficiency or conservation. ▪ Model Urban Center District requires minimum percentage of housing to be devoted to workforce and affordable housing units which allows workers to live near jobs or transit and reduce vehicle miles traveled. ▪ County has no small-scale by-right mixed-use zone district which discourages vertical mixed-use developments outside of Urban Center Districts. ▪ One accessory dwelling unit allowed up to a maximum of 600 square feet for attached and detached single-family units.
33-284.46.C, and 47	**Traditional Neighborhood Development District (TND**)—A goal of the district is to have a hierarchy of streets that serves the needs of the pedestrian, the bicycle and the automobile. Standards that reinforce this goal can conserve energy use through alternative modes of movement. This goal is supported by a design criteria requirement for pedestrian pathways to be interconnected and run through blocks running from street to street.

REGULATIONS ADDRESSING ENERGY EFFICIENCY AND CONSERVATION	
COUNTY CODE REF.	**REGULATION**
33-1 (31.1)	The code includes the use of a "construction debris materials recovery transfer facility" in industrial districts and defines it to allow the use and processing that will help to reduce solid waste material associated with construction and demolition activities from entering the landfills and for recycling operations, both of which can save energy.
SUBDIVISION REGULATIONS	
28.0	There appear to be no references to energy efficiency or conservation goals or standards in Chapter 28 of the county code relating to subdivisions.
LANDSCAPE ORDINANCE AND TREE PROTECTION	
18A-2.E	**Purpose and Intent**—The regulations indicate that trees and shrubs should be used for energy conservation by encouraging cooling through the provision of shade and the channeling of breezes, thereby helping to offset global warming and local heat island effects through the added absorption of carbon dioxide and reduction of heat islands.
18A-3, 7	**Definitions**—Defines an "energy conservation zone" as a vegetated buffer around structures that increases the likelihood that landscaping can assist with energy conservation on a site. (A zone located no more than twenty-two (22) feet from a structure in a one hundred eighty (180) degree band from due east of the northeast point of the structure, to due south, to due west of the northwest point of the structure.)
18A-4, 5, 7	**Tree Protection—**Requires existing vegetation survey and cross-references county regulations regarding removal of trees, specimen trees, or vegetation in a natural forest community (Section 24-60 of the county code). Existing specimen trees must be preserved "to the maximum extent possible," but no criteria included to help define this standard. As an incentive, preserved natural forest areas are deducted from the total area used to calculate minimum landscaping requirements, but can't be counted towards landscaping requirements. Can be counted towards minimum open space requirements.
18A-6.A, C,D	**Minimum Landscape Standards—**Contains several provisions that are geared to save water: ▪ Maximum turf areas (note that developers asserted that the county requires turf around stormwater detention ponds). ▪ Specifies a minimum percentage of trees and shrubs that must be native or low maintenance and drought-tolerant species. ▪ Minimum number of trees must be planted on each site depending on use type, but the 28 trees/net acre requirement in most zone districts appears high for infill and redevelopment areas. Urban Center Districts reduce this to 16 trees/net acre. ▪ Required open space requirements for most zone districts are very suburban in nature—20-30% in commercial and office and 40% in planned developments.
18A-6.B	**Minimum Standards, Irrigation**—Contains several provisions related to water conservation: ▪ Requires permanent and temporary irrigation systems with any new or replacement landscaping. This type of provision can unnecessarily require the use of water and un-

REGULATIONS ADDRESSING ENERGY EFFICIENCY AND CONSERVATION	
COUNTY CODE REF.	**REGULATION**
	dermine the goal of using native species and maintaining natural vegetation on the site. However, long-term irrigation prohibited for native plant communities and natural forest communities. ▪ Irrigation systems must be designed to allow differential operation/hydrozones. ▪ Rain switches or other automatic controls must be installed.
18A-7E	**Landscape Plan Review Criteria—** ▪ Trees and shrubs are required to be planted in the energy conservation zone around buildings "where feasible" in order to reduce energy consumption by shading buildings and reduce heat island effects by shading paved surfaces. "Where feasible" not defined. ▪ Plants with similar water needs are to be grouped in hydrozones. ▪ Native species are required to be used.
22-60	**Tree Removal**—Permit required to remove any tree or understory vegetation in a natural forest. Single family residential exempt except for specimen trees. Percent limitations on amount of canopy or understory that can be cleared. Specimen trees must be preserved "whenever reasonably possible." Replacement required for trees removed, with double requirements if specimen trees removed. Standards included for tree protection during construction. No special standards or allowances for tree protection on infill and redevelopment sites. With exception of specimen tree regulations, standards appear geared mainly to large-scale suburban developments.
HISTORIC PRESERVATION REGULATIONS	
16A	Miami-Dade County has adopted historic preservation regulations that apply to both the incorporated and unincorporated lands of the county, except in circumstances where municipalities have enacted their own historic preservation regulations that meet minimum standards established in Ch. 16A. Certificates of appropriateness must be secured from the county before any alteration, renovation, or demolition of designated historic structures is allowed. The county's historic preservation regulations are very general in nature in terms of standards for decision-making and specifically do not address criteria or contain design standards having to do with solar panels, wind turbines, water cisterns, or other energy-related appurtenant structures or additions to historic sites. The standards of review are, "to promote maintenance, restoration, adaptive reuses appropriate to the property, and compatible contemporary designs which are harmonious with the exterior architectural and landscape features of the neighboring buildings, sites, and streetscapes." Building permit applications for changes to buildings designated as historic sites or located within historic districts are put on hold by the building department until a formal application is submitted by the applicant and approved by the county.

REGULATIONS ADDRESSING ENERGY EFFICIENCY AND CONSERVATION	
COUNTY CODE REF.	**REGULATION**
BUILDING CODE	
2007 Florida Building Code, Chapter 13, *Energy Efficiency*	Title XXXIII, Ch. 553, Section 553.900 et seq. of the Florida Statutes sets forth general thermal efficiency standards for building construction in the state. The law specifically forbids local governments from requiring buildings to "meet standards more stringent than the provisions of the Florida Energy Efficiency Code For Building Construction." The Florida State Building Code, promulgated by the Department of Community Affairs pursuant Ch. 553, states in relevant part (Chapter 13, Section 13-101.0 General): "This code is a statewide uniform code and shall not be made more stringent or lenient by local government. The code provides for a uniform standard of energy efficiency by, at a minimum, setting forth minimum requirements for exterior envelopes, lighting, electrical distribution, and selection of heating, lighting, ventilating, air conditioning and service water heating systems. It shall apply to all new buildings, to additions to existing buildings and manufactured homes, to renovations to existing buildings, both public and private, with certain exceptions, to changes of occupancy type, to the site-installed components and features of manufactured homes at their first set-up, and to the installation or replacement of building systems and components with new products for which thermal efficiency standards are set by this code. New buildings, with the exception of those exempted below, and in accordance with the specific exceptions of individual sections shall be designed to comply with Subchapter 13-4 or 13-6 of this code.." This means that Miami-Dade County is currently prohibited from requiring more stringent energy performance of buildings than those required by the Florida statute. Sections 553.904, 553.905 and 553.906 on thermal efficiency standards for new nonresidential, residential, and renovated buildings state, in part, that such buildings "shall not be required to meet standards more stringent than the provisions of the Florida Energy Efficiency Code for Building Construction."
M-D County Part III, Code of Ordinances, Ch. 8C	This chapter on "Building Security Measures" sets forth standards for illumination of parking lots and alleys.
M-D County Part III, Code of Ordinances, Ch. 8.1	This provision incorporates the Florida Building Code, as complemented and supplemented by the Administration (Article I) and Enforcement (Article II) provisions, as amended through local technical amendments (Article III), if any, together with the product approval sections (Article IV) as the building code for both the incorporated and unincorporated areas of the county.
M-D County Part III, Code of Ordinances, Ch. 8.2	**Optional Provisions**—This provision incorporates the Florida Building Code and optional provisions including the High Velocity Hurricane Zones and provisions into the Miami-Dade Code of Ordinances.

REGULATIONS ADDRESSING ENERGY EFFICIENCY AND CONSERVATION	
COUNTY CODE REF.	**REGULATION**
M-D County Part III, Code of Ordinances, Ch. 8, Art. IV Section 8-40	**Product Approval**—This provision requires the materials and products used for protection of the envelope of structures , limited to windows, exterior glazing, wall cladding, roofing, exterior doors, skylights, glass block, siding and shutters, in Miami-Dade County to obtain a high wind velocity zone approval from the Florida Building Commission or obtain local approval in accordance with Sections 553.842 (Product Evaluation and Approval) and 553.8425 (Local Product Approval) of the Florida Statutes.
M-D County Part III, Code of Ordinances, Ch. 8-6	**Expedited Permitting Program for Green Buildings**—This provision covers the implementation of a program to expedite the review and approval of permit applications for "green buildings". This section defines a green building as one whose design, construction, and operation promote the preservation of resources and environmentally sensitive construction practices, systems and materials. In making the determination of whether the structure is a green building, the Building Official is to rely on the review, evaluation and where available registration or certification of the design by recognized environmental rating agencies including the Florida Green Building Coalition, the National Home Builder Association and the U.S. Green Building Council. The green buildings program is implemented through administrative order to be approved by the Board of County Commissioners.

Diagnosis

ENERGY EFFICIENCY AND CONSERVATION		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
REMOVE BARRIERS		
EC-B.1[5]: Most zoning code development standards (parking, landscaping, open space), except for Urban Center Districts, are suburban-oriented—discourage infill and redevelopment. Fire and Public Works Departments reportedly do	▪ Tailor development standards for infill and redevelopment throughout county, not just urban centers (e.g., alternatives to setting aside significant % of sites for open space—allow provision of urban amenities like improved plazas). Planning and Zoning staff have proposed	▪ Laramie, WY, Cedar Rapids, IA, and Winnipeg, Canada, have customized landscaping, parking, and open space standards for mature areas of city. ▪ Franklin, TN, has adopted traditional neighborhood development standards for older areas of city. Chapter 5, Section 5.3.9

[5] NOTE TO STAFF: We are using this numbering system to make reference to specific recommendations easier to identify and locate. For example, "EC" refers to the topic of energy efficiency and conservation. The "B" refers to the subtopic of barriers. Similarly, a reference to "GG-R.1", would mean the topic greenhouse gas emission reductions and "R" would be a reference to the subtopic of filling regulatory gaps.

ENERGY EFFICIENCY AND CONSERVATION		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
not accept narrower streets as specified in Urban Center Districts and county Urban Design Manual.	a new Mixed-Use Corridor District that will promote integrated mixed-use development along designated major roadways. This district contains customized parking and other development standards to that end. ▪ Work with Fire and Public Works Departments to ensure that they accept street standards tailored for infill and redevelopment areas.	▪ Salt Lake City has adopted "Complete Street Standards" by mayoral executive order. Allows narrower streets, requires provision of sidewalks and bike lanes.
EC-B.2: Zoning code does not allow accessory dwelling units (secondary residences) in single-family residential districts. Are allowed in some other districts (e.g., RU-2, Two-Family Residential, Urban Center).	Remove existing restrictions on accessory dwelling unit in single-family zone districts to allow in more zoning districts. Include protective standards related to unit size, ownership, occupancy of principal dwelling, etc.	▪ City of Santa Cruz, CA, has progressive accessory dwelling unit program implemented through zoning code. Ch. 24.16, Part 2 ▪ Sarasota County, FL, allows accessory dwelling units in half of its residential zones in accordance with standards. Sec. 5.1.2 and 5.3.2.a ▪ Seattle, WA, permits "backyard cottages" (detached accessory dwelling units) in many residential zone districts. SMC: Title 23, Sec. 44.041 and for link, see footnote. [6]
EC-B.3: Except for Urban Center Districts, off-street parking requirements excessive for many uses such as multi-family.	Reduce base off-street parking requirements across the board for infill and redevelopment. Increase automatic reduction for mixed-use projects. Allow on-street parking adjacent to property to count towards minimum on-street requirements. Adopt maximum parking limits to promote more compact, dense urban development. Proposed Mixed-Use Corridor District contains reduced parking for mixed-use projects.	▪ Austin, TX, grants vertical mixed-use buildings automatic 60% parking reduction. ▪ Anchorage, AK, grants automatic 25% reduction in parking for mixed-use projects. ▪ Irving, TX, limits commercial and industrial use parking to 125% of the minimum required parking. ▪ Denver, CO, limits parking for transit-oriented development to no more than 110% of the minimum parking spaces required.

[6] http://www.seattle.gov/dpd/static/Backyard%20Cottages%20Guide_web_LatestReleased_DPDS015822.pdf

ENERGY EFFICIENCY AND CONSERVATION		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
EC-B.4: Strict nonconforming use/structure requirements discourage "green" building expansion.	Allow renovations/expansions related to "green building" systems and improvements (e.g., adding solar panels, insulation, etc.) to take place without bringing entire use, structure, or site into full compliance. Allow expansions that reduce the degree of nonconformity or do not increase it to proceed without full compliance.	▪ Salt Lake City is adopting provision allowing "green building" improvements to nonconforming uses/structures without full site compliance. ▪ Many mature communities allow expansion of nonconforming uses/structures if the expansion does not increase the degree of nonconformity.
EC-B.5: Historic preservation standards of review do not address solar systems on roofs and may inhibit or delay installation.	Adopt clear hierarchy of preferred locations for solar on historic sites. Allow on front roof under some specified circumstances with provisions to ensure compatibility.	▪ State of California bars absolute prohibitions of solar on roofs of historic structures. ▪ Salt Lake City is adopting a hierarchy of preferred locations for solar on historic sites, but may be allowed on front yard roofs as last resort.
EC-B.6: Not clear that zoning code allows rain barrels and water cisterns as permitted accessory uses and to occupy side yards. Not mentioned in definitions or accessory use/district use lists.	Clarify that rain barrels and cisterns as permitted accessory uses in all zone districts. Allow to be located within or be placed underground in side yards as minor encroachments.	▪ Portland, OR, permits water cisterns as an accessory use in accordance with design standards for compatibility. ▪ Arlington, VA, allows rain barrels as permitted accessory use and provides rain barrels to homeowners at nominal cost.
Building Code		
EC-B.7: The 2007 Florida Building Code, Chapter 13, *Energy Efficiency,*, *Section 13-101.0 General,* states: This code is a statewide uniform code and shall not be made more stringent or lenient by local government. This means that Miami-Dade County is currently unable to require more stringent energy performance of buildings than those required by the State code.	Work with state legislature, the International Code Council, and others to change the state law that prevents local jurisdictions from enacting more stringent energy performance standards to meet individual local community needs and goals. Offer the International Green Construction Code (IGCC) as a voluntary "stretch" code that people who want to go beyond current state energy code minimums can use to comply and offer incentives to do so.	Seattle and Clark County, WA, created flexibility in land use and building regulations to enable the construction of a limited number of projects attempting to meet the Living Building Challenge criteria for net-zero impact or better projects, in order to better understand the regulatory constraints to the most advanced building and development practices. (See related recommendations in the Permitting/Plan Review/Inspection section of this diagnosis.)

ENERGY EFFICIENCY AND CONSERVATION		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
EC-B.8: The State-required energy compliance software is pass/fail though it depends on meeting many different elements and requirements. The system lacks a method to ensure that all the design information, details, and specifications on which the determination of compliance was based are available to the inspector onsite – to verify that what is built fully conforms to what was approved.	Adopt policy changes that require the full details on which the energy modeling is based to be included in the plans and specifications required to be onsite during inspections. The county could further encourage the state to adopt the same to allow for uniformity and predictability for all municipalities in the county.	NEED
EC-B.9: Green/vegetated roofs are not currently addressed specifically in the building code. Reportedly these are allowed by staff on a case-by-case review basis.	Initiate research and adopt guidelines for green roofs in high wind areas because of potential energy savings, heat island mitigation, and stormwater management benefits. Vegetation may be limited to low-growing or ground cover.	▪ Henderson, NV, allows green roofs as an alternative to other permitted roof forms. (By necessity due to climate and lack of water, vegetation tends to be low-growing and ground cover type plants.) ▪ Portland, OR, has adopted intensity/density bonus incentives for green roof installation.
EC-B.10: Miami-Dade County Approved Rainwater Harvesting Guidelines restrict harvested rainwater use to outdoor irrigation and other outdoor non-potable purposes.	Develop policies to use of non-potable rainwater for indoor uses such as toilet flushing and clothes washing. Based on such policies, adopt rainwater harvesting ordinance based on the existing guidelines as well as inclusion of guidelines for indoor uses. Although concerns have been raised about the cost and additional energy required to treat rainwater added to the sewerage flow, that energy use is offset by the reduced energy use for the treat-	▪ Tucson, AZ, has adopted a comprehensive rainwater harvesting requirement for commercial uses and a detailed design manual [7] ▪ The State of Georgia has adopted amendments to the 2006 International Plumbing Code to allow rainwater and grey water to be used for flushing toilets. It published a comprehensive Rainwater Harvesting Guidelines that allow for indoor non-potable water use if filtered and disinfected in accord-

[7] http://dot.tucsonaz.gov/stormwater/downloads/2006WaterHarvesting.pdf

ENERGY EFFICIENCY AND CONSERVATION		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
	ment and supply of the potable water that would have been used instead. In addition there are water demand and stormwater reduction benefits resulting from increased onsite use of rainwater.	ance with the state plumbing code.[8] ▪ The State of Arizona allows low-volume residential grey water systems to be installed without permits. ▪ For additional reference links, see footnote.[9]
EC-B.11: The Florida State Plumbing Code was updated in 2009 to allow grey water to be used for flushing of toilets and urinals. *Florida Plumbing Code Appendix C, Gray Water Recycling Systems.*	Consider adopting provisions of the Florida Plumbing Code to allow use of grey water for flushing of toilets and urinals.	See references above to Tucson and State of Georgia Rainwater Harvesting codes and guidelines for indoor use.
EC-B.12: The county water and sewer department (WASD) is an enterprise fund department that bases charges to cover water system and wastewater treatment system costs on water usage. WASD is concerned that indoor use of harvested rainwater will add to sewage treatment volume and expense with no basis to recover added system costs. Harvested rainwater going into the	Conduct an economic analysis that includes the potential overall water system supply benefits (both increased actual supply of water available for use and lowered demand on existing potable water supply system and associate savings) resulting from using harvested rainwater for interior uses. Benefits include reduced infrastructure development, operation, and maintenance costs required to meet M-D County's future water needs, as well as reduced energy use required, with	

[8] http://www.dca.ga.gov/development/constructioncodes/programs/downloads/GeorgiaRainWaterHarvestingGuidelines_2009.pdf

[9] These two documents from Seattle and Portland, Oregon, related to the Living Building Challenge goals of Net-Zero Water for built projects provide the most comprehensive and current overview and approach to addressing the spectrum of building and development related water issues: "Seattle Regulatory Pathways to Net Zero Water" - http://ilbi.org/resources/Resources-Documents/Reports-Docs/WaterDocs/seattle-regulatory-pathways-to-net-zero-water/view and Portland's "Achieving Water Independence in Buildings" - http://ilbi.org/resources/Resources-Documents/Reports-Docs/WaterDocs/Achieving_Water_Independence_in_Buildings.pdf/view
Consider adopting provisions allowing low-volume residential greywater systems to be installed without permits such as in Arizona. http://azdeq.gov/environ/water/permits/reclaimed.html
Consider the State of Georgia's Rainwater Harvesting Guidelines: http://dca.state.ga.us/development/constructioncodes/ programs/downloads/GeorgiaRainWaterHarvestingGuidelines_2009.pdf

ENERGY EFFICIENCY AND CONSERVATION		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
wastewater system is not metered and there is no formula developed to address the lost revenue.	accompanying GHG reductions resulting from the reduced water demand. These would be balanced against the potential increase in wastewater volume and expenses and impacts from that additional treatment. Also consider the potential benefits of a larger volume of reclaimed water or water available for aquifer recharge.	
CREATE INCENTIVES		
EC-I.1: Zoning code and landscaping ordinance do not address or recognize green/vegetated roofs.	Allow vegetated/green roofs to count toward landscaping and open space requirements or provide bonus (height, density, etc.) . Add section on vegetated/green roofs to Urban Design Manual to provide additional guidance.	▪ Portland, OR, grants FAR bonus for ecoroofs in selected zone districts. Green/vegetated roofs count toward open space requirements. Ch. 33, Title 510, Sec. 210.C.4 ▪ Chicago, IL, provides a floor area bonus for buildings with green roofs in compliance with specific regulations. Title 17, Ch. 4, Sec. 1015 ▪ Miami, FL, allows vegetated amenity decks to count towards open space requirement (up to 25%).
EC-I.2: Zoning code parking regulations do not address parking or services for alternative fuel vehicles, carpool vehicles, and shuttles.	Allow for creation of priority parking spaces for alternative fuel vehicles, carpool vehicles, and shuttles.	▪ Puget Sound Regional Council (PSRC) Model Development Regulations and Guidance reserves parking spaces for electric vehicle charging stations and counts the spaces toward the minimum parking requirement. Regulations also specify location and design criteria. ▪ Los Angeles, CA, provides preferential parking for hybrid vehicles. ▪ LEED awards 3 points out of 40 for basic certification for provision of preferential alternative fuel vehicle parking.

ENERGY EFFICIENCY AND CONSERVATION		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
EC-I.3: Zoning code does not address electric vehicle charging stations as a use in zone districts.	Specifically allow electric vehicle charging stations as accessory use in all zone districts.	Communities in Washington—Thurston, Pierce, King, and Snohomish Counties--permit electron vehicle charging stations in all zoning districts except those designated for residential and resource protection. The EVI Model Ordinance guided these counties. For link, see footnote.[10]
EC-I.4: Various zoning code and landscape ordinance provisions require the protection of large trees and preservation/planting of native vegetation. However, no additional landscaping credit for preserving trees in infill situations where it is most challenging to do so.	Provide bonus credit towards landscaping requirements for preservation of large existing trees for infill development.	Franklin, TN (Ch. 5, Sec. 2.4(6)), and Colleyville, TX, provide landscaping credit for protecting existing mature trees.
Building Code		
EC-I.5: No fee rebates available in Miami-Dade County for green building systems.	Create a rebate or "feebate" program that adds a surcharge for project that minimally meet the energy code and provides a sliding scale of rebates for projects exceeding the energy code, based on performance.	Portland, OR, created a Feebate program as an incentive for green building—with projects that merely met the state building code paying a sq/ft development fee, buildings achieving LEED Silver certification have their development fees waived, and buildings achieving LEED Gold, Platinum, or Living Building Challenge receiving rebates ranging from $1.73 to $17.30/sq. ft.[11]
EC-I.6: Expedited permitting program for green buildings. (Ch. 8-6)	Consider amending expedited permitting program to apply to all county departments involved in the permitting and approvals process for green buildings, for both new and existing buildings.	▪ Arlington County, VA, "Green Home Choice Program" allows for the expediting of development approval at the zoning review and building permit process levels. The program applies to only single-

[10] http://www.commerce.wa.gov/DesktopModules/CTEDPublications/CTEDPublicationsView.aspx? tabID=0&ItemID=8851&MId=863&wversion=Staging

[11] http://www.buildinggreen.com/auth/article.cfm/2009/1/29/Portland-to-Introduce-Green-

ENERGY EFFICIENCY AND CONSERVATION		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
	Explore using the International Green Construction Code as the standard for buildings to qualify for expedited permitting.	family to low-density housing (+/- 12 units, 2-story). The program is an incentive program that allows for expedited review processes at all levels of review - building, planning, utilities, and referral departments. The builder must meet a "green checklist" provided by the Environmental Services Office that includes numerous standards that the building permit must address and then the permit is expedited. For link, see footnote. [12] ▪ Arlington County, VA, has adopted a Green Building Density Incentive Policy for Site Plans to encourage private developers of large office, high-rise residential, and mixed-use projects to design, construct, and operate environmentally responsible buildings. The bonus density program applies to special exception site plan requests allowing bonus density and/or height. The program uses LEED building ratings and has an enforcement provision in place that requires bonding by the developer to ensure building performance.
FILLING REGULATORY GAPS		
EC-R.1: Zone districts specify maximum densities, but not minimum density or minimum mix of uses. County does address minimum densities in mixed-use areas by limiting low-density housing types such as single-family.	Consider requiring minimum densities in some areas, especially in potential transit-oriented development or in mixed-use buildings that include residential units. As proposed in 2010 EAR, require minimum mix of commercial/office uses in residential to provide employment and minimum mix of residential units in	▪ Many cities require minimum densities in areas designated for mixed-use and transit-oriented development, including Portland, OR (Ch. 33, Title 120, Sec. 205); Sparks and Henderson, NV (Ch. 19.3, Sec. 18); and Denver, CO. ▪ Orange County, FL proposed MXDAC mixed-use district specifies minimum use mix in designated

[12] http://www.arlingtonva.us/departments/EnvironmentalServices/epo/EnvironmentalServicesEpoGreenHomeChoice.aspx

ENERGY EFFICIENCY AND CONSERVATION		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
	commercial areas to provide housing close to jobs.	areas.
EC-R.2: Urban Center Districts address sidewalk, connectivity requirements, but most zone districts and subdivision regulations do not.	Create mandatory internal and external connectivity standards for all major developments.	▪ The Florida DOT adopted connectivity standards in its "Model Regulations for Multimodal Transportation Districts." ▪ Franklin, TN, adopted a connectivity index with numerical standards to assess new subdivisions. Ch. 5, Sec. 10.4
EC-R.3: Zoning ordinance outdoor lighting regulations are minimal as are those found in Chapter 8C (Building Security Measures) of the County Code. Neither address modern energy-saving approaches or technologies like solid-state and LED lighting.	Consider adopting comprehensive outdoor lighting code that addresses maximum illumination, lighting budgets, lighting curfews, etc.	▪ Consider adoption of model regulatory provisions recommended by the illuminating Engineers Society of America (IES) and International Dark-Sky Association (IDA), like maximum wattage, required luminaries or lamp shading, curfews for lighting, and more. For link, see footnote. [13] ▪ Plymouth, MN, has adopted progressive outdoor lighting ordinance that restricts illumination levels and establishes site lighting budgets. Salt Lake City considering similar provisions.
EC-R.4: No mandatory minimum percentage of energy generation from alternative sources for buildings/developments.	Require minimum alternative energy percentage generation or, purchase. Also consider requiring solar water heating on all new single family homes or significant remodels. If feasible or as a potential second phase, require solar water heating for multi-family and commercial projects. For solar electric, require all new residences to be "solar-ready" for photovoltaic systems to facilitate addition of pv systems at a future date.	▪ Henderson, NV, awards 5 points in sustainability point system if 20% of energy is generated on-site from renewable sources. 3 points if off-site. Sec. 19.7.12 ▪ LEED-ND awards 1 point if 5% of energy is generated from renewable sources. ▪ Tucson requires all new homes to be "solar-ready."

[13] http://www.ies.org/handbook/ and http://www.darksky.org/mc/page.do?sitePageId=84399

ENERGY EFFICIENCY AND CONSERVATION		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
EC-R.5: Zoning code and landscape ordinance contain no provisions relating to cool roofs, green roofs.	Consider requiring cool roofs and/or green roofs. Provide for exceptions where such roofs are technically not appropriate or feasible.	▪ Golden, CO offers 1 sustainability point, out of a required 25, for 10 sq. ft. of a vegetative roof. ▪ Chicago requires green roofs on all new downtown buildings. ▪ LEED-ND awards 1 point for cool or shaded roof. ▪ Portland, OR, requires ecoroofs for all new city facilities with 70% coverage and high reflectance, ENERGY STAR-rated roof material on the remainder of the roof area. For reference link, see footnote. [14]
EC-R.6: Zoning code does not address shade structures.	Consider making shade structures mandatory on building facades, roofs, and in parking lots and minimum solar reflectance for roofs and pavement.	▪ City of Miami requires 50% of parking spaces to be under cover, and the roof must have a solar reflectance of at least 0.30 OR 50% of the site's hardscape to be shaded, have a solar reflectance of 0.3, or be a pervious surface. Art. 3, Sec. 13.2.d ▪ Buckeye, AZ, requires shaded walkways along 50% of all commercial building facades adjacent to or facing sidewalks, parking areas, and outdoor gathering spaces. In addition, shaded sidewalks must constitute at least 30% of the total sidewalks in the development. Art. 5, Sec. 8.3.C.2 ▪ Marana, AZ, requires pedestrian shade structures from entrances of larger retail buildings to public streets to encourage walking. Title 08, Sec. 07.03.A.3.b.2
EC-R.7: Subdivision and zoning codes do not address solar-oriented lots and subdivisions.	Require minimum percentage of lots in larger subdivisions to be solar oriented (i.e., longer east-west axis) to minimize solar heat	▪ Fort Collins, CO requires 65% of 15,000 sq. ft or greater residential lots to be "solar-oriented". ▪ Multnomah County, OR and Ft.

[14] Resolution: http://www.portlandonline.com/shared/cfm/image.cfm?id=112682

ENERGY EFFICIENCY AND CONSERVATION		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
	gain in summer and optimize solar heat gain in winter).	Collins, CO require 20-30% of lots in new subdivisions to be solar-oriented. ▪ LEED-ND wards point for solar oriented building or block design.
EC-R.8: Zoning code provisions related to bicycle parking are basic at best.	Require more parking plus other facilities (showers, lockers, etc.). Tailor to specific uses instead of tying to vehicle parking space requirements.	▪ Consider adopting new bicycle parking guidelines recommended by Assn. of Pedestrian and Bicycle Professionals (2d Edition 2010). ▪ Austin, TX, awards points in sustainability scoring system for showers, secure indoor bike lockers, etc.
EC-R.9: Zoning code does not address electric vehicle charging stations.	Consider requiring certain percentage/number of parking spaces to have electric vehicle charging stations or be prewired to provide in future.	▪ San Francisco, CA, building code requires new construction to be prewired for electric car chargers. ▪ Golden, CO, offers 2 sustainability points, out of a required 25, for installing 3% of required parking as electric plug-in stations.
EC-R.10: Zoning code and subdivision regulations do not address solar access protection.	Consider adding more formal process for protecting solar access.	▪ Boulder, CO, has detailed solar access review for every development to protect adjacent solar "envelope". Title 9, Ch. 9, Sec. 17 ▪ Laramie, WY, allows registration of solar panels that triggers protection. ▪ See Kettles, *A Comprehensive Review of Solar Access Laws In Use And Suggested Standards For A Model Ordinance*. See footnote. [15]
EC-R.11: Zoning code and subdivision regulations do not address homeowner covenants that restrict small-scale solar installations.	Consider adding provisions that ban homeowner covenants that ban solar systems allowed by county building and zoning regulations.	▪ States such as Colorado and Nevada have banned homeowner covenants that restrict solar installations. ▪ Salt Lake City and other jurisdictions ban restrictive solar covenants through subdivision and planned development review regulations.

[15] http://www.solarabcs.org/solaraccess/Solaraccess-full.pdf

ENERGY EFFICIENCY AND CONSERVATION		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
EC-R.12: Zoning code and other development ordinances do not address transportation demand management (e.g., staggered work hours, bus passes, provision of van pools, on-site day care and other facilities) to reduce vehicle miles traveled.	Work with regional transportation agency to adopt transportation demand management requirement for large employers and institutions (e.g., employ techniques to reduce projected traffic by 25%).	▪ Arlington, VA, has adopted mandatory TDM requirements for major developments along the regional Metro rail line that has allowed significant growth without expanding the roadway network. ▪ Bellevue, WA, implemented a commute trip reduction program that decreased the drive-alone rate in downtown Bellevue by 30%. ▪ Los Angeles, CA, eliminated free parking in major employment centers with a resulting reduction in auto trips of between 15 and 38%. ▪ Boulder, CO, introduced reduced-cost transit pass program to achieve a cutback from 56% to 36% of employees driving to work in its downtown.
EC-R.13: Landscape ordinance contains many progressive provisions, but can be taken to next level to realize even more substantial water conservation.	Make targeted revisions to Landscape ordinance: ▪ Require water budgets for all MR and non-residential projects that require reductions in water use a specified % below average current use. ▪ Require irrigation systems to be on separate meters for monitoring purposes. ▪ Require all plant materials, not just trees/shrubs, to have minimum % of drought-tolerant species. Staff reportedly requires this informally, but not in code. ▪ Establish efficiency standards of irrigation systems. ▪ Create standards to address soil preparation and amendment. ▪ Establish annual water audits and mandatory remedial measures if water budgets ex-	▪ California has adopted a mandatory model water-efficient landscaping ordinance that all local govts. must meet or exceed—requires water budgets, hydrozoning, efficient irrigation systems. Title 23, Div. 2, Chpt 2.7 ▪ Salt Lake City planning commission has approved a new aggressive water-efficient landscape ordinance with water budgets, annual audits, and irrigation system efficiency standards. ▪ Seattle's Green Factor is a landscape requirement designed to increase the quantity and quality of planted areas. It requires new development in commercial and potentially multi-family zones to achieve a certain score using the Seattle Green Factor score sheet. Some of the items included on the score sheet are green roofs, trees,

ENERGY EFFICIENCY AND CONSERVATION		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
	ceeded. ▪ Do not require turf around stormwater detention areas.	vegetated walls, permeable paving, drought tolerant species, and food cultivation. For link, see footnote.[16]
EC-R.14: Tree protection regulations are geared primarily to large developments with extensive canopies. Some protection for specimen trees.	Add tailored tree protection standards for infill and redevelopment sites. Require 1:1 caliper mitigation if specimen trees can't be saved. Allow some off-site mitigation. Do not apply canopy retention standards to infill sites.	▪ Oak Park, IL, and Clayton, MO, have adopted infill-area tree protection standards requiring 1:1 mitigation and allowing off-site mitigation. ▪ Salt Lake City requires permit for any tree removal along riparian corridors and 1:1 replacement. ▪ Washington, D.C., requires protection and/or replacement of large trees in specified residential areas. Title 24, Ch. 3702 ▪ See generally, *American Planning Association PAS Report 446, Tree Conservation Ordinances*.
EC-R.15: Zoning code contains scattered provisions related to use of natural lighting and ventilation, orientation to breezes, and use of landscaping to direct cooling wind currents (e.g., in Downtown Kendall Urban Center District).	Consider more specific standards and guidance for landscaping and building orientation and design to promote natural ventilation that conserves energy. Add appropriate guidelines to county urban design manual.	▪ Albuquerque, NM, has criteria for natural wind ventilation in several downtown zone districts. ▪ Abu Dhabi (United Arab Emirates) Estidama sustainability standards require consideration of natural ventilation and wind cooling in development and building design.
Building Code		
EC-R.16: State law precludes local governments from enacting energy codes that are more or less stringent than the State Building Energy Code.	Consider adopting the International Green Construction Code (IGCC) as a voluntary "stretch" code to facilitate the construction of "beyond code" projects while also working for statewide adoption of this code. Compliance with IGCC would qualify for expedited green building permit program and future tenant im-	▪ The State of Oregon is developing a "Reach Code" to provide an optional set of energy efficiency construction standards that exceed the state's mandatory codes. The Reach Code will act like an alternative option allowing builders to have an optional "green" path and of approved technologies and construction methods.[18]

[16] www.seattle.gov/dpd/permits/greenfactor/overview/

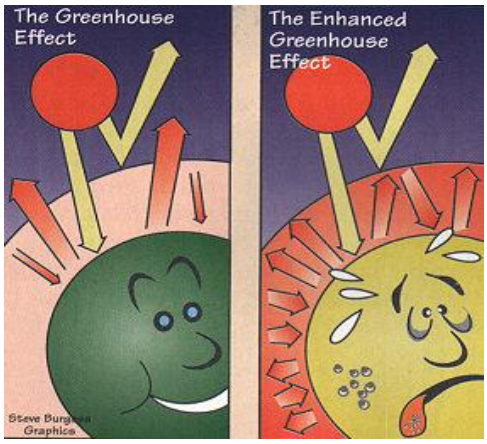
ENERGY EFFICIENCY AND CONSERVATION		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
	provements. For link, see footnote.[17]	▪ The State of Massachusetts has developed a similar Stretch Code for energy conservation to provide a more energy efficient alternative to the base code energy for new and existing buildings. Information can be found at the Building and Environmental Affairs Department web site.[19]
EC-R.17: No provisions are currently in place for allowing projects striving to achieve net-zero energy, water, GHG, and other project impacts.	Consider allowing more experimental and new technology building options by adopting a pilot program to allow "Living Building Challenge" projects.	Seattle and Clark County, WA, "Living Building Challenge." (See recommendations in the Permitting/Plan Review/Inspection section of this diagnosis.)
EC-R.18: Approved county guidelines for harvested rainwater do not allow indoor uses, negating the potential for individual building and system-wide energy and water savings.	The Florida State Plumbing Code was updated in 2009 to allow grey water to be used for flushing of toilets and urinals. *Florida Plumbing Code Appendix C, Gray Water Recycling Systems.* Explore local building/plumbing code amendments to allow rainwater to be used for non-potable purposes indoors such as toilet flushing that can promote water conservation and energy savings.	▪ Tucson, AZ, has adopted a comprehensive rainwater harvesting requirement for commercial uses and a detailed design manual [20]. ▪ The State of Georgia has adopted amendments to the 2006 International Plumbing Code to allow rainwater and grey water to be used for flushing toilets. It published a comprehensive Rainwater Harvesting Guidelines that allow for indoor non-potable water use if filtered and disinfected in accordance with the state plumbing code.[21] ▪ The State of Arizona allows low-volume residential grey water systems to be installed without permits.

[18] www.cbs.state.or.us/bcd/committees/11reachcode.html#purpose
[17] www.iccsafe.org/cs/igcc/pages/default.aspx
[19] http://www.mass.gov/?pageID=eoeeaterminal&L=4&L0=Home&L1=Energy%2C+Utilities+%26+Clean+Technologies&L2= Energy+Efficiency&L3=Policies+and+Regulations+for+Energy+Efficiency&sid=Eoeea&b=terminalcontent&f=doer_Energy_Efficiency_Building_energy_Codes&csid=Eoeea
[20] http://dot.tucsonaz.gov/stormwater/downloads/2006WaterHarvesting.pdf
[21] http://www.dca.ga.gov/development/constructioncodes/programs/downloads/GeorgiaRainWaterHarvestingGuidelines_2009.pdf

GREENHOUSE GAS REDUCTIONS

Introduction

This section of the diagnosis addresses the related topics of greenhouse gas reductions and climate change and identifies regulatory options for addressing these intertwined issues. Climate change is increasingly being accepted as a scientific fact that will require communities to create policies and solutions to address the problem. Tangible evidence seems to be accumulating on an almost daily basis—shorter winters, melting polar ice caps, extreme storms, rising sea levels, and deeper droughts. The earth's climate is predicted to change because of human activities altering the chemical composition of the atmosphere. There most likely will be increases in temperature and changes in precipitation, soil moisture, and sea level, which could have adverse effects on many ecological systems, as well as on human health and the economy.



The greenhouse effect – greenhouse gases trap heat and are linked to the leading cause of global warming.

Greenhouse gases (GHGs), with their undisputed heat-trapping properties, are increasingly linked to and seen as the leading cause of global warming. GHGs are primarily made up of carbon dioxide, methane, nitrous oxides, and chlorofluorocarbons. They contribute to global warming by trapping infrared radiation and heat from the sun within the earth's atmosphere. Human activity has increased the atmospheric concentrations of these gases by 36, 148, and 18 percent respectively from the preindustrial area (1750) to 2005. This increased concentration of greenhouse gases coincides with 2010 being the warmest period on record since 1880. Additionally, federal agencies indicated that sea level rose by about 8 inches over the past century, but ominously the rate of rise has doubled recently.

The bulk of greenhouse gases emitted in the U.S. are associated with electricity generation (34%) transportation (27%), and industrial fuel use (14%). Buildings account for about 37 percent of total U.S. energy consumption and approximately 70 percent of electrical consumption. The burning of fossil fuels – coal, oil, and natural gas – for energy is the primary source of greenhouse gas emissions. According to the 2010 draft county comprehensive development master plan Evaluation and Appraisal Report (EAR), Miami-Dade County's CO2 emissions in 2005 were about 31.9 million tons, an annual increase of 8.5 million tons or 36.5 percent since 1988. The county's population grew only by about 27 percent during this period. Per capita CO2 emissions increased by 8 percent over this same period. Not surprisingly, the 2010 draft EAR identified climate change as one of the four major pressing issues that had to be addressed in the updated comprehensive development management plan that guides growth in the county.

Current Policies and Programs

One of the first jurisdictions nationally to take seriously the potential impacts of climate change, Miami-Dade County has for many years been dealing with the issue and greenhouse gas emissions. The county joined ICLEI (now called Local Governments for Sustainability) in 1990, and by 1993 the county had adopted its Urban CO2 Reduction Plan which has successfully reduced carbon dioxide (CO_2) emissions by

about 34 million tons by 2005.[22] Other initiatives include creating the Climate Change Advisory Task Force (CCATF), joining in the Chicago Climate Exchange (CCX) pilot program, and the joint establishment of the Southeast Florida Regional Climate Change Compact. Importantly, the recently adopted *GreenPrint* document has embraced even more ambitious goals related to climate change:

- Stop increasing GHG emissions by 2010 and achieve a 10% reduction every five years after that through 2010.
- Reduce electricity use in internal county operations by 20 % of 2007 levels by 2014.
- Plant half a million trees by 2015 to achieve a 30 percent tree canopy by 2020 and encourage native, drought tolerant landscaping to cool our communities, capture greenhouse gas emissions, beautify our neighborhoods, and provide wildlife habitat.

The county is also working on or has completed a number of major plans that have direct relevance to greenhouse gas reductions including the Bicycle Facilities Plan 2025, the Long Range Transportation Plan, the Open Space Master Plan, the Pedestrian Plan, the Street Tree Master Plan, the Water Use Efficiency Plan, and the Solid Waste Master Plan 2012.

Next Steps: The Role of Development and Building Codes

Development and building codes have a critical role to play in helping the county reach its greenhouse gas reduction goals. The development and building code strategies for greenhouse gas reductions addressed in this section fall into three main categories:

1. Reducing, reusing, and recycling of wastes, thus reducing methane gas and carbon dioxide production,
2. Promoting compact, mixed-use development patterns leading to less auto-dependent mobility and reduced vehicle miles traveled, and
3. Preserving existing trees and planting new trees and other vegetation that can sequester CO2, thereby cleaning the air of major GHGs.

Other related strategies, such as supporting alternative energy generation, thereby reducing reliance on fossil fuel and GHG generating sources such as oil, gas, and coal-fired power plants are dealt with in the section that follows on renewable energy.

The high volume and often unnecessary disposal of waste is a significant contributor to greenhouse gases. Waste buried in landfills produces high levels of methane gas that often escapes into the atmosphere; waste incinerators release carbon dioxide. Furthermore, waste that is not reused or recycled must be replaced with virgin materials that require the consumption of additional energy to manufacture them, primarily from fossil fuels, thus creating GHG emissions. In a sustainable community, used materials should not become waste until the community has decided there is no other possible use for the materials. A comprehensive solid waste management program should incorporate:

- Reduction of the amount of waste produced,
- Reuse of waste materials where possible, and
- Recycling of wastes.

[22] http://www.miamidade.gov/PlanZone/ear2010/library/2010EARChapter1Draft.pdf, Draft 2010 EAR

The county requires recycling by all multifamily residential and commercial establishments and is currently working on a new solid waste management master plan. The county is one of the most extensive single-stream recycling programs in the Southeast and has one of the largest waste-to-energy facilities in the United States. With its federal energy block grant funds, the county is also constructing a 1.2 MW cogeneration system to generate electricity from biogas produced at the county's wastewater treatment plan and landfill gases generated at a nearby solid waste landfill. However, more can be done. For example, the county should consider requiring construction waste management plans for all larger projects that require separation and recycling.

Promoting compact growth through zoning is another important strategy to reduce GHG emissions--encouraging mixed-use development (residential and commercial use in same area), reduced parking requirements, transportation alternatives, walkable communities, and compact/denser building design. Such approaches can enable a community to fight climate change (and improve quality of life) by reducing personal automobile dependence and encouraging renewable energy usage. Several studies have linked denser, compact communities with reduced driving and in turn, reduced GHG emissions. For example, a study by Reid Ewing of 83 metro areas found that residents in compact regions such as Portland and Boston drive 25 percent less than sprawling regions such as Atlanta and Raleigh.[23] Higher-density urban areas, especially those incorporating mixed uses, make public transit and people-powered transportation more practical, while reducing emissions and encouraging exercise. Importantly, the county has already created six Urban Center Districts in the zoning ordinance since 2003 that promote mixed-use, higher density development.

Miami-Dade County has begun to lay the groundwork for increasing sustainable development patterns. The Comprehensive Development Master Plan (CDMP) states "the location and configuration of Miami-Dade County's urban growth through the year 2025 shall emphasize concentration and intensification of development around centers of activity, development of well-designed communities containing a variety of uses, housing types and public services, renewal and rehabilitation of blighted areas, and contiguous urban expansion when warranted, rather than sprawl."[24] The 2010 EAR emphasizes this policy and recommends many actions to foster compact urban development and reduce sprawl.

Additionally, in an effort to create more sustainable and healthy communities, cities throughout the country are moving beyond thinking of trees in more traditional terms, such as for beautification, and making them part of the city's "green" infrastructure–for shade to reduce energy use and to absorb carbon dioxide. In this role, trees can be used to control and filter stormwater, reduce sediment into surface waters, limit flooding, reduce greenhouse gases, clean pollution from the air, save energy on cooling, and reduce the urban heat island effect — a particularly important concern for hot communities such as Miami-Dade. According to the U.S. Department of Energy, a 30-year old hardwood tree can sequester the equivalent of 136 pounds of carbon dioxide annually. It takes about 70 such trees to offset the carbon dioxide emissions from one medium-sized car for the year. In addition to the preservation of existing trees, new trees in conjunction with development, in parks, and in available spaces along the city's right-of-ways should also be areas of focus. The county has a number of tree protection regulations and requirements that can be improved to be even more effective by tailoring them to accommodate infill and redevelopment projects.

[23] Ewing, Growing Cooler: The Evidence on Urban Development and Climate Change (2009).
[24] http://www.miamidade.gov/planzone/planning_metro_CDMP.asp

Current Regulations

The following table cites some of the main current regulations in the county's development and building codes related to greenhouse gas reduction and climate change. It is not meant to be all-inclusive, but to highlight some of the key provisions currently on the books that are directly related to this topic. Additionally, similar measures are set forth in the sections on Renewable Energy and Energy Efficiency/Conservation that are closely related topics.

REGULATIONS ADDRESSING GREENHOUSE GAS REDUCTIONS	
COUNTY CODE REF.	**REGULATION**
CHAPTER 15 SOLID WASTE MANAGEMENT	
15-2.2 and 2.3	**Recycling Programs—**All multifamily residential and commercial establishments must provide recycling programs for listed materials (newspaper, glass, etc.).
15-4	**Storage/Collection Plans—**Before building permits can be issued for construction of commercial or multifamily residential, plans for collection and storage of solid waste must be approved by county as to location, accessibility, and number or adequacy.
ZONING CODE	
33-1	**Accessory Dwelling Units—**"Accessory building" defined to include "secondary residence." Secondary residence not defined and no general standards in zoning code regarding size, design, etc. Secondary residences not allowed in single-family zone districts; guesthouses and servant's quarters are allowed. Sec. 33.201 sets forth criteria regarding illegal subdivision of a residence.
33-284.55 et seq.	**Recycling—**Downtown Kendall Urban Center District and several other urban districts require each building to "dedicate a specific location for recycling separation, storage, and access." However, there are no criteria regarding size, location, and other parameters.
33-122 et seq.	**Off-Street Parking—**Off-street parking requirements are geared primarily for suburban scale development. No general parking reductions for development near transit or mixed-use projects or parking maximums. More modern parking regulations found in Urban Center Districts. ▪ Section contains minimal bike parking requirements regarding number of spaces and location. (33-122.3) ▪ No transportation demand management requirements.
33-193 et seq.	**Workforce Housing Program—**Generally sets standards for inclusion of workforce housing in new residential developments. Promotes energy conservation by providing housing for workers close to jobs or transit thereby reducing vehicle miles traveled.
33-284.10 and 284.24	**Planned Development and Planned Area Development Districts—**Contain general reference to energy conservation in review criteria: "Design methods to reduce energy consumption shall be encouraged. Energy conservation methods my include…natural ventilation of structures, siting of structures in relation to prevailing breezes and sun angles, insulation of structures, use of landscape material for shade, direct of breezes and transpiration. No guidance in county's urban design manual on such "design methods." No mention of renewable energy incentives or requirements. Three acre minimum may limit use for infill and redevelopment sites which are often smaller.

REGULATIONS ADDRESSING GREENHOUSE GAS REDUCTIONS	
COUNTY CODE REF.	**REGULATION**
33-284.87	**Urban Center District Regulations—**The Standard Urban Center District and other Urban Center Districts contain numerous progressive standards and regulations to promote mixed-use development and alternative forms of transportation (walking, bikes, etc.), thus reducing vehicle miles traveled and associated energy use. ▪ Tree requirements are 16/net acre which is a substantial reduction from normally required 28 acre for planned developments and in many non-residential districts. ▪ On-street parking counts towards parking requirements, thus promoting denser, more compact developments. Other alterative parking requirements also provide flexibility and reduce over-parking of sites. Promotes energy-efficient infill development. ▪ Model Urban Center District requires minimum percentage of housing to be devoted to workforce and affordable housing units which allows workers to live near jobs or transit and reduce vehicle miles traveled. ▪ County has no small-scale by-right mixed-use zone district which discourages vertical mixed-use developments outside of the Urban Centers District. ▪ One accessory dwelling unit allowed up to a maximum of 600 square feet for attached and detached single-family units.
33-284.46.C, and 47	**Traditional Neighborhood Development District (TND)—**A goal of the district is to have a hierarchy of streets that serves the needs of the pedestrian, the bicycle and the automobile. Standards that reinforce this goal can conserve energy use through alternative modes of movement. This goal is supported by a design criteria requirement for pedestrian pathways to be interconnected and run through blocks running from street to street.
33-1 (31.1)	The code includes the use of a "construction debris materials recovery transfer facility" in industrial districts and defines it to allow the use and processing that will help to reduce solid waste material associated with construction and demolition activities from entering the landfills and for recycling operations, both of which can save energy.
SUBDIVISION REGULATIONS	
28.0	There appear to be no references to recycling, compact development, or tree protection in Chapter 28 of the county code relating to subdivisions.
LANDSCAPE ORDINANCE AND TREE PROTECTION	
18A-2.E	**Purpose and Intent—**The regulations indicate that trees and shrubs should be used for energy conservation by encouraging cooling through the provision of shade and the channeling of breezes, thereby helping to offset global warming and local heat island effects through the added absorption of carbon dioxide and reduction of heat islands.
18A-4, 5, 7	**Tree Protection—**Requires existing vegetation survey and cross-references county regulations regarding removal of trees, specimen trees, or vegetation in a natural forest community (Section 24-60 of the county Code). Existing specimen trees must be preserved "to the maximum extent possible," but no criteria included to help define this standard. As an incentive, preserved natural forest areas are deducted from the total area used to calculate minimum landscaping requirements, but can't be counted towards

REGULATIONS ADDRESSING GREENHOUSE GAS REDUCTIONS	
COUNTY CODE REF.	**REGULATION**
	landscaping requirements.
18A-6.A, C,D	**Minimum Landscape Standards—**Contains several provisions related to trees: ▪ Specifies a minimum percentage of trees and shrubs that must be native or low maintenance and drought-tolerant species. ▪ Minimum number of trees must be planted on each site depending on use type, but the 28 trees/net acre requirement in most zone districts appears high for)infill and re-development areas. Urban Center Districts reduce this to 16 trees/net acre. ▪ Required open space requirements for most zone districts are very suburban in nature—20-30% in commercial and office and 40% in planned developments.
24-60	Permit required to remove any tree or understory vegetation in a natural forest. Single family residential exempt except for specimen trees. Percent limitations on amount of canopy or understory that can be cleared. Specimen trees must be preserved "whenever reasonably possible." Replacement required for trees removed, with double requirements if specimen trees removed. Standards included for tree protection during construction. No special standards or allowances for tree protection on infill and redevelopment sites. Standards appear geared mainly to large-scale suburban developments.
HISTORIC PRESERVATION REGULATIONS	
16A	Miami-Dade County has adopted historic preservation regulations that apply to both the incorporated and unincorporated lands of the county, except in circumstances where municipalities have enacted their own historic preservation regulations that meet minimum standards established in Ch. 16A. Preservation of building resources adds to energy conservation through the continued use of resources embedded in existing structures and the reduction in the consumption of natural resources.
BUILDING CODE	
2007 Florida Building Code, Chapter 13, *Energy Efficiency*	Title XXXIII, Ch. 553, Section 553.900 et seq. of the Florida Statutes sets forth general thermal efficiency standards for building construction in the state. The law specifically forbids local governments from requiring buildings to "meet standards more stringent than the provisions of the Florida Energy Efficiency Code For Building Construction." The Florida State Building Code, promulgated by the Department of Community Affairs pursuant Ch. 553, states in relevant part (Chapter 13, Section 13-101.0 General): "This code is a statewide uniform code and shall not be made more stringent or lenient by local government. The code provides for a uniform standard of energy efficiency by, at a minimum, setting forth minimum requirements for exterior envelopes, lighting, electrical distribution, and selection of heating, lighting, ventilating, air conditioning and service water heating systems. It shall apply to all new buildings, to additions to existing buildings and manufactured homes, to renovations to existing buildings, both public and private, with certain exceptions, to changes of occupancy type, to the site-installed components and features of manufactured homes at their first set-up, and to the installation or replacement of building systems and components with new products for which thermal efficiency standards are set by this code. New buildings, with the exception of those exempted

REGULATIONS ADDRESSING GREENHOUSE GAS REDUCTIONS	
COUNTY CODE REF.	**REGULATION**
	below, and in accordance with the specific exceptions of individual sections shall be designed to comply with Subchapter 13-4 or 13-6 of this code.." This means that Miami-Dade County is currently prohibited from requiring more stringent energy performance of buildings than those required by the Florida statute. Sections 553.904, 553.905 and 553.906 on thermal efficiency standards for new nonresidential, residential, and renovated buildings state, in part, that such buildings "shall not be required to meet standards more stringent than the provisions of the Florida Energy Efficiency Code for Building Construction."
Miami-Dade County Code of Ordinances, Parts I, II, III	Miami-Dade County, Florida Code of Ordinances, Part III, Code of Ordinances, Chapter 8 – Building Code, Articles I –Administration, II –South Florida Building Code, III –Florida Building Code, Including Article I, Sections 8-2 – Incorporation of Florida Building Code Adoption of Optional Provisions.
8.IV	**Product Approval—**Any person desiring to use materials/products used for protection of the envelope of the structure, limited to windows, exterior glazing, wall cladding, roofing, exterior doors, skylights, glass block, siding and shutters shall obtain a high wind velocity zone approval from the Florida Building Commission or shall obtain a local approval in accordance with Sections 553.842 and 553.8425 of the Florida Statutes.
8-6	**Expedited Permitting Program for Green Buildings—**Directs the Building Official to implement a program to expedite the review and approval of permit applications for green buildings. "As used in this Section a green building means one whose design, construction, and operations promote the preservation of resources and environmentally sensitive construction practices, systems and materials. In making the determination of whether the structure is a green building, the Building Official is to rely on the review, evaluation and where available registration or certification of the design by recognized environmental rating agencies including the Florida Green Building Coalition, the National Home Builder Association and the U.S. Green Building Council. The green buildings program shall be implemented through administrative order to be approved by the Board of County Commissioners."

Diagnosis

GREENHOUSE GAS REDUCTIONS		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
REMOVE BARRIERS		
Recycling		
GG-B.1: Current zoning code does not address community-serving recycling or composting stations for neighborhoods or in residential subdivisions or large commercial projects.	Allow recycling and composting stations as a permitted or special exception use in most zone districts, subject to locational and compatibility standards.	▪ Henderson, NV, grants 2 points in its sustainability point review system for providing an on-site composting station for all occupants. Sec. 19.7.12 ▪ LEED-ND GIB Credit 16: Solid Waste Management Infrastructure. ▪ See *Turning a Liability Into An Asset: A Landfill Gas-to-Energy Project Development Handbook (US EPA).*
Development Patterns—Mixed-Use, Infill, and Compact Growth		
GG-B.2: While several districts tailor development standards for infill, other infill areas subject to suburban development standards.	Consider adopting tailored development standards (landscaping, parking, open space) for designated infill and redevelopment areas throughout city.	▪ Laramie, WY, Cedar Rapids, IA, and Winnipeg, Canada, have customized landscaping, parking, and open space standards for mature areas of city. ▪ Franklin, TN, has adopted traditional neighborhood standards for older areas of city. Chapter 5, Section 5.3.9
GG-B.3: Zoning code does not allow accessory dwelling units (secondary residences) in single-family residential districts. Are allowed in some other districts (e.g., RU-2, Two-Family Residential, Urban Center).	Remove existing restrictions on accessory dwelling unit to allow in single-family zone districts. Include protective standards related to unit size, ownership, occupancy of principal dwelling, etc.	▪ City of Santa Cruz, CA, has progressive accessory dwelling unit program implemented through zoning code. Ch. 24.16, Part 2 ▪ Sarasota County, FL, allows accessory dwelling units in half of its residential zones in accordance with standards. Art. 5, Sec. 1.2 and Sec. 3.2.a ▪ Seattle, WA, permits “backyard cottages“ (detached accessory dwelling units) in many residential zone districts. SMC: Sec.23.44.041

GREENHOUSE GAS REDUCTIONS		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
GG-B.4: Generally applicable off-street parking requirements excessive for many uses. Geared for suburban uses.	Reduce base off-street parking requirements. Increase automatic reduction for mixed-use projects near existing/planned transit stops (now 10%). Allow on-street parking adjacent to property to count towards minimum on-street requirements. Adopt maximum parking limits.	▪ Austin, TX, grants vertical mixed-use buildings automatic 60% parking reduction. ▪ Anchorage, AK, grants automatic 25% reduction in parking for mixed-use projects. ▪ Many cities have adopted maximum parking limits (e.g., 125% of minimum).
GG-B.5: Strict nonconforming use/structure requirements discourage "green" building renovation/expansion.	Allow renovations/expansions related to "green building" (e.g., adding solar panels, insulation, etc.) to take place without bringing entire site into compliance or allow expansions that reduce the degree of nonconformity or do not increase it to proceed without full compliance.	▪ Salt Lake City is adopting provision allowing "green building" improvements to nonconforming uses/structures without full site compliance. ▪ Many mature communities allow expansion of nonconforming uses/structures if the expansion does not increase the degree of nonconforming.
Building Code		
See all recommended actions under Energy Efficiency and Conservation, Building Code Barriers.		
CREATE INCENTIVES		
Recycling		
GG-I.1: Current code does not provide incentives for composting.	Allow additional seating, less parking, or other bonus to restaurants, grocery stores or institutional users if a composting facility is provided on-site or used off-site.	▪ Henderson, NV, grants 2 points in its sustainability point review system for providing an on-site composting station for all occupants. Sec. 19.7.12 ▪ LEED-ND GIB Credit 15: Recycled Content in Infrastructure and Credit 16: Solid Waste Management Infrastructure.
Development Patterns—Mixed-Use, Infill, and Compact Growth		
GG-I.2: Existing mixed-use zone districts create some incentives for mixed-use projects.	Offer development bonuses (height, density, etc.) for implementing sustainability goals. Tailor development standards to encourage infill and redevelopment.	▪ Austin, TX, grants vertical mixed-use buildings with minimum use mix a wide variety of major incentives (no front setbacks, no FAR, no building coverage limits, additional uses.

GREENHOUSE GAS REDUCTIONS		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
GG-I.3: Zoning code does not mention or address vegetated/green roofs.	Allow vegetated/green roofs to count toward landscaping and open space requirements or provide bonus (height, density, etc.)	▪ Portland, OR, grants FAR bonus for ecoroofs in selected zone districts. Ch. 33, Title 510, Sec. 210.C.4 ▪ Miami, FL, allows 25% of landscaping requirement to be met an amenity deck.
Tree and Vegetation Preservation and Planting		
GG-I.4: Zoning Code and Landscape Ordinance provisions protect native vegetation but do not give landscape credit for preserving trees.	Provide bonus credit towards landscaping requirements for preservation of large existing trees, including non-native species.	Franklin, TN (Ch. 5, Sec. 2.4(6)), and Colleyville, TX, offer landscaping credit for protecting existing mature trees.
Building Code		
See all recommended actions under Energy Efficiency and Conservation, Building Code Incentives.		
FILLING REGULATORY GAPS		
Recycling		
GG-R.1: Current code requires recycling areas to be identified with access, but provides no specific standards to guide reviews.	Require recycling station/facilities in multi-family, commercial, and new residential subdivisions that are convenient to both users and pick-up vendors. Specify minimum sizes for recycling areas in buildings and outdoors as applicable. Require recycling bins inside all new residential units.	▪ Austin, TX, requires an easily-accessible and clearly-marked area for recycling serving the entire facility in its green building commercial program. ▪ Salt Lake City is considering regulations requiring recycling sites in commercial and multi-family buildings and recycling bins in all residential structures. ▪ Seattle, WA, requires storage space for recycling containers with specific area and design regulations. SMC Title 23, Sec. 47-A.029 and Sec. 48.031 ▪ Portland, OR, requires all multi-family complexes and business to recycle 75% of the waste they produce. Food scrap-generating businesses are required to separate the food scraps for composting. Ch. 17, Title 102, Sec. 270

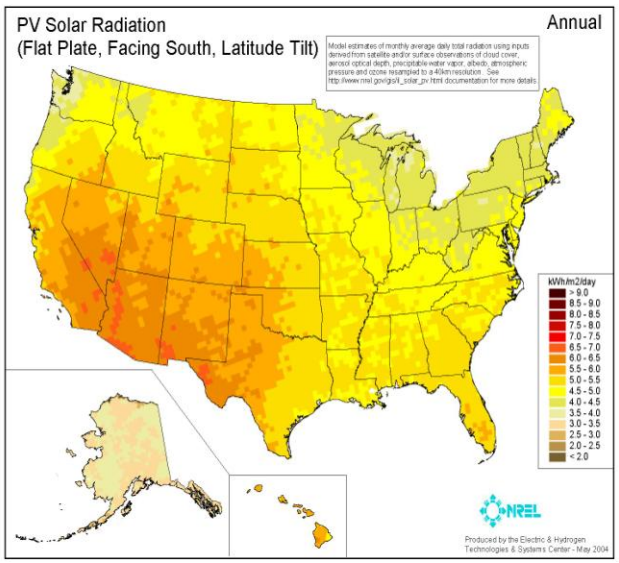
GREENHOUSE GAS REDUCTIONS		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
GG-R.2: Current code does not encourage or require recycling of construction waste.	Require that construction management plans be required for projects of certain size and that the handling of construction waste be detailed in the plan. Or, if a reasonable facility exists to recycle or compost construction waste, the city could require a certain percentage of construction waste be recycled.	▪ LEED ND (Green Construction and Technology #18) addresses construction waste management; #19 addresses co posting stations. ▪ San Mateo, CA, has a comprehensive ordinance requiring the diversion or recycling of construction and demolition debris. CA state law requires all jurisdictions to have major waste reduction programs or pay penalties. ▪ Portland, OR requires all building projects exceeding $50,000 to recycle 75% of the solid waste produced on the job site, including demolition and construction. Ch. 17, Title 102, Sec.270.d ▪ Pitkin County, CO, requires construction management plans that must address construction site waste reduction and recycling. They also require deconstruction instead of demolition and separation of materials for recycling or resale.
Development Patterns—Mixed-Use, Infill, and Compact Growth		
GG-R.3: LUC specifies maximum densities, but not minimum density or minimum mix of uses.	Consider requiring minimum densities, especially in potential transit-oriented development and mixed-use areas.	▪ Many cities require minimum densities in areas designated for mixed-use and transit-oriented development, including Portland, OR (Ch. 33, Title 120, Sec. 205); Sparks and Henderson, NV (Ch. 19.3, Sec. 18); and Denver, CO. ▪ Orange County, FL, proposed MXDAC mixed-use district specifies minimum use mix in designated areas. ▪ Eagle County, CO, awards points within its sustainable communities index for infill development; more points for more surrounding development. Points are also

GREENHOUSE GAS REDUCTIONS		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
		awarded for meeting certain density requirements, providing a mix of nonresidential uses, a diversity of housing types, affordable housing, walkable streets, proximity to transit, and others. ▪ Roswell, GA, MPMUD zone requires a mix of commercial, office or industrial, and residential uses. Ch. 7, Art. 3, Sec. 2.2
GG-R.4: Several urban center districts address sidewalk, connectivity requirements.	Create mandatory internal and external connectivity standards for all major developments.	▪ The Florida DOT adopted connectivity standards in its "Model Regulations for Multimodal Transportation Districts." ▪ Franklin, TN, adopted a connectivity index with numerical standards to assess new subdivisions. Ch. 5, Sec. 10.4
Tree and Vegetation Preservation and Planting		
GG-R.5: Tree protection regulations are geared primarily to large suburban developments with extensive tree canopies. Some protection for specimen trees.	Add tailored tree protection standards for infill and redevelopment sites. Require 1:1 caliper mitigation if specimen trees can't be saved. Allow some off-site mitigation. Do not apply canopy retention standards to infill sites.	▪ Oak Park, IL, and Clayton, MO, have adopted infill-area tree protection standards requiring 1:1 mitigation and allowing off-site mitigation. ▪ Salt Lake City requires permit for any tree removal along riparian corridors and 1:1 replacement. ▪ Washington, D.C., requires protection and/or replacement of large trees in specified residential areas. Title 24, Ch. 3702 ▪ See generally, American Planning Association PAS Report 446, *Tree Conservation Ordinances.*
Building Code		
See all recommended actions under Energy Efficiency and Conservation, Building Code Filling Regulatory Gaps.		

RENEWABLE ENERGY

Introduction

Renewable energy production has been a hot topic for many communities around the nation as concern has grown about the dependence of the country and many local economies on fossil fuels – coal, oil, and natural gas. The U.S. Department of Energy reports that more than 85 percent of the energy consumed in the United States comes from fossil fuels – that is nearly two-thirds of our electricity and virtually all of our transportation fuels. Energy generation from fossil fuels is the single large contributor to greenhouse gas emissions, which have many negative impacts on the environment. And, from a global perspective, the U.S. generates 25 percent of global greenhouse gas emissions while only comprising four percent of the world's population.



Sunny Florida Has Strong Solar Power Potential

Aside from substantial environmental benefits, renewable energy can enhance the nation's energy security. Lessening reliance on foreign oil is a national priority. Additionally, smaller and more geographically distributed generation at many locations within a city around the grid increases power reliability and quality while reducing the strain on the electricity transmission system.[25]

Renewable energy, such as wind, sun, geothermal, and biofuels, is becoming a more viable source for power as technology advances. In the U.S. only about 10 percent of energy is generated from renewable sources[26] and only about 0.1 percent from solar. However, the amount is projected to increase rapidly as oil prices continue to increase—some experts estimate that by 2015 the cost of solar will be on part with the cost of fossil fuel and that by 2025 it will be cheaper. Awareness and interest in these issues have also increased as funding and incentives for renewable energy projects have become more readily available to local governments, businesses, and homeowners.

Just a few years ago, Florida was at the forefront of the solar power movement, ranking third in total grid-connected solar capacity in 2009 when the giant Arcadia solar plant in Martin County came on line. It has since fallen to fifth place in 2010, and it is behind at least seven states in terms of photo-voltaic solar system orders for the 2010-2014 period—behind such "sunny" places as Maryland, New Jersey, and Massachusetts. At one time, the state offered a solar system rebate program for homeowners, but the state legislature killed funding for that program in 2009 which ended with a waiting list of 16,000 businesses and homeowners.

[25] Lovins, H., Small Is Profitable, p.47
[26] http://www.eia.doe.gov/cneaf/electricity/epm/table1_1.html

Florida generally has less potential for use of other types of land-based renewable energy systems. According to federal sources, its wind and geothermal potential are modest at best. Nevertheless, Miami-Dade County has funded an urban wind energy pilot project that will conduct a real-world evaluation of small wind turbines to determine the potential for increased use of this renewable energy source on county facilities. This project is being funded out of the county's federal energy efficiency and conservation block grant.

In Miami-Dade County, electricity and transportation are responsible for 92 percent of all emissions. Florida Power and Light (FPL), owning and operating two power plants in the county, provides most of the electricity for Miami-Dade County. It primarily uses natural gas (75.5%) and nuclear power (12%) to produce electricity. Only 0.1% of its power comes from renewable sources—solar. FPL does have a net metering program that allows homeowners and businesses with small solar systems to feed electricity back into the grid and receive payment for it at the end of the year. FPL is constructing three major solar energy projects throughout the state that it states will prevent emissions of more than 3.5 million tons of greenhouse gases (the equivalent of 25,000 cars annually).

According to *GreenPrint*, the rate of increase in Miami-Dade County's electricity use is outpacing that of its population growth. Between 2000 and 2007, per capita electricity use increased due in significant part to increased development square footage, demand for air conditioning, and the growing use of home appliances like large screen televisions. This trend appears to have leveled off in the last few years, partially due to the economic recession.

Current Policies and Programs

Miami-Dade County has adopted a number of policies and programs and undertaken demonstration projects aimed at supporting renewable energy generation.

- The county is working towards a goal of reducing government electricity use by 20 percent from 2007 to 2014 in accordance with Board of County Commissioners legislation.
- County policy requires that all county-owned building projects, both new construction and renovation, be certified at the LEED silver level.
- The Draft 2010 Evaluation and Appraisal Report on the county's Comprehensive Development Master Plan suggests adding new policies such as establishing a Climate Change Checklist that would be used to evaluate the sustainable elements of the proposed development or redevelopment and requiring energy efficiency and conservation as well as the use of renewable energy resources in housing design and developments.
- The county has initiated a number of solar power demonstration projects, such as installing photovoltaic panels on the roofs of three county park buildings.
- The county has created a sustainable technologies demonstration program for the testing and application of sustainable building produces, systems, and processes. The program will test their applicability and reliability for the Southern Florida climate.

Next Steps: The Role of Development and Building Codes

Although Miami-Dade County has taken a number of important steps to promote renewable energy sources, many observers believe much more could be done to promote renewable energy use, especially solar. Knowledgeable stakeholders who were interviewed as part of this sustainable code revision project cited administrative and procedural issues in the permitting and product approval

processes for solar energy systems as hurdles to increased use of solar systems—and these issues are addressed in the chapter of the report that follows (*Permitting/Plan Review/Inspection Process).* Additionally, there are some opportunities to revise the county's development codes to foster increased use of renewable energy systems such as:

- Clarifying zoning code provisions applicable to renewable energy generation (e.g., zone district and use regulations) to more explicitly address appropriate locations and standards for the full range of renewable energy facilities;
- Removing barriers to other alternative energy systems like district energy and co-generation systems, wind, and ground-source heating/cooling;
- Revamping existing strict non-conforming use/structure regulations to encourage redevelopment and alternative energy retrofits of existing buildings;
- Clarifying historic district regulations to ensure solar systems and other renewable energy facilities are not precluded;
- Preserving solar access to properties and protect solar access of installed solar systems;
- Requiring a minimum amount of energy in new developments come from renewable energy sources; and
- Prohibiting in the development review and approval process homeowner covenants that restrict solar or wind installation and collection technologies.

Current Regulations

The following table cites some of the main current regulations in the county's development and building codes related to renewable energy. It is not meant to be all-inclusive, but to highlight some of the key provisions currently on the books that are directly related to this topic. Additionally, similar measures are set forth in the sections on Greenhouse Gas Reduction and Energy Efficiency/Conservation that are closely related topics.

REGULATIONS ADDRESSING RENEWABLE ENERGY	
COUNTY CODE REF.	**REGULATION**
ZONING CODE	
33-1	**Definitions**—No definitions of solar, wind, or other renewable energy systems. No definition of mechanical equipment that might include renewable energy systems.
33-35	**Nonconforming Uses**—Strict nonconforming use and structure regulations do not allow any expansion of nonconforming uses or structures even if do not increase degree of nonconformity. May hinder rehabilitation and installation of renewable energy systems for older non-conforming structures and uses.
33-55	**Height Limits and Exemptions**—Renewable energy systems are not mentioned in list of structures (such as enclosures for mechanical equipment) that are exempt from general height restrictions.
Zone Districts	**Renewable Energy Generation**—Solar, wind, and other renewable energy systems not specifically listed as permissible principle or accessory uses in any zone district.

REGULATIONS ADDRESSING RENEWABLE ENERGY	
COUNTY CODE REF.	**REGULATION**
33-284.10 and 284.24	**Planned Development and Planned Area Development Districts—**Contain general reference to energy conservation in review criteria: "Design methods to reduce energy consumption shall be encouraged. Energy conservation methods my include…natural ventilation of structures, siting of structures in relation to prevailing breezes and sun angles, insulation of structures, use of landscape material for shade, direct of breezes and transpiration." No guidance in county's urban design manual on such "design methods." No mention of renewable energy incentives or requirements in district regulations or in urban design manual.
33-284-55 et seq.	**Downtown Kendall Urban Center District**—This district and other mixed-use/transit districts require screening of rooftop mechanical equipment. Could be interpreted to apply to rooftop solar and wind energy systems.
SUBDIVISION REGULATIONS	
28.0	There appear to be no references to renewable energy systems, solar-oriented lots, or solar access in Chapter 28 of the county Code relating to subdivisions.
LANDSCAPE ORDINANCE AND TREE PROTECTION	
18A-2.E	**Purpose and Intent—**There is no mention of protecting of solar access or preventing blockage of solar access by trees or vegetation in this section or anywhere else in landscape ordinance or code's tree protection provisions.
24-60	**Tree Removal—**Permit required to remove any tree or understory vegetation in a natural forest. No reference to protection of solar access.
HISTORIC PRESERVATION REGULATIONS	
16A	Miami-Dade County has adopted historic preservation regulations that apply to both the incorporated and unincorporated lands of the county, except in circumstances where municipalities have enacted their own historic preservation regulations that meet minimum standards established in Ch. 16A. Certificates of appropriateness must be secured from the county before any alteration, renovation, or demolition of designated historic structures is allowed. The county's historic preservation regulations are very general in nature in terms of standards for decision-making and specifically do not address criteria or contain design standards having to do with solar panels, wind turbines, water cisterns, or other energy-related appurtenant structures or additions to historic sites. The standards of review are, "to promote maintenance, restoration, adaptive reuses appropriate to the property, and compatible contemporary designs which are harmonious with the exterior architectural and landscape features of the neighboring buildings, sites, and streetscapes." Building permit applications for changes to buildings designated as historic sites or located within historic districts are put on hold by the building department until a formal application is submitted by the applicant and approved by the county.

REGULATIONS ADDRESSING RENEWABLE ENERGY	
COUNTY CODE REF.	**REGULATION**
BUILDING CODE	
2007 Florida Building Code, Chapter 13, *Energy Efficiency*	Title XXXIII, Ch. 553, Section 553.900 et seq. of the Florida Statutes sets forth general thermal efficiency standards for building construction in the state. The law specifically forbids local governments from requiring buildings to "meet standards more stringent than the provisions of the Florida Energy Efficiency Code For Building Construction." The Florida State Building Code, promulgated by the Department of Community Affairs pursuant Ch. 553, states in relevant part (Chapter 13, Section 13-101.0 General): "This code is a statewide uniform code and shall not be made more stringent or lenient by local government. The code provides for a uniform standard of energy efficiency by, at a minimum, setting forth minimum requirements for exterior envelopes, lighting, electrical distribution, and selection of heating, lighting, ventilating, air conditioning and service water heating systems. It shall apply to all new buildings, to additions to existing buildings and manufactured homes, to renovations to existing buildings, both public and private, with certain exceptions, to changes of occupancy type, to the site-installed components and features of manufactured homes at their first set-up, and to the installation or replacement of building systems and components with new products for which thermal efficiency standards are set by this code. New buildings, with the exception of those exempted below, and in accordance with the specific exceptions of individual sections shall be designed to comply with Subchapter 13-4 or 13-6 of this code." This means that Miami-Dade County is currently prohibited from requiring more stringent energy performance of buildings than those required by the Florida statute. Sections 553.904, 553.905 and 553.906 on thermal efficiency standards for new nonresidential, residential, and renovated buildings state, in part, that such buildings "shall not be required to meet standards more stringent than the provisions of the Florida Energy Efficiency Code for Building Construction."
M-D County Part III, Code of Ordinances, Ch. 8.1	This provision incorporates the Florida Building Code, as complemented and supplemented by the Administration (Article I) and Enforcement (Article II) provisions, as amended through local technical amendments (Article III), if any, together with the product approval sections (Article IV) as the building code for both the incorporated and unincorporated areas of the county.
M-D County Part III, Code of Ordinances, Ch. 8.2	**Optional Provisions**—This provision incorporates the Florida Building Code and optional provisions including the High Velocity Hurricane Zones and provisions into the Miami-Dade Code of Ordinances.
M-D County Part III, Code of Ordinances, Ch. 8, Art. IV Section 8-40	**Product Approval**—This provision requires the materials and products used for protection of the envelope of structures , limited to windows, exterior glazing, wall cladding, roofing, exterior doors, skylights, glass block, siding and shutters, in Miami-Dade County to obtain a high wind velocity zone approval from the Florida Building Commission or obtain local approval in accordance with Sections 553.842 (Product Evaluation and Approval) and 553.8425 (Local Product Approval) of the Florida Statutes.

REGULATIONS ADDRESSING RENEWABLE ENERGY	
COUNTY CODE REF.	**REGULATION**
M-D County Part III, Code of Ordinances, Ch. 8-6	**Expedited Permitting Program for Green Buildings**—This provision covers the implementation of a program to expedite the review and approval of permit applications for "green buildings". This section defines a green building as one whose design, construction, and operation promote the preservation of resources and environmentally sensitive construction practices, systems and materials. In making the determination of whether the structure is a green building, the Building Official is to rely on the review, evaluation and where available registration or certification of the design by recognized environmental rating agencies including the Florida Green Building Coalition, the National Home Builder Association and the U.S. Green Building Council. The green buildings program is implemented through administrative order to be approved by the Board of County Commissioners.

Diagnosis

RENEWABLE ENERGY		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
REMOVE BARRIERS		
RE-B.1: Zoning code contains no mention of solar systems nor does it contain review criteria or compatibility standards.	Incorporate separate definitions and performance criteria for different types and scales of renewable energy facilities to explicitly address where these various types may or may not be appropriate. Include safety and compatibility standards. Add renewable energy section to county Urban Design Manual to provide additional guidance.	▪ Denver, CO, permits solar and photovoltaic energy systems as an accessory structure subject to the building form standards for accessory structures. ▪ Seattle, WA, permits by-right solar collectors, solar greenhouses, and other solar devices as an accessory use with specific design criteria for each district. The area covered or enclosed by solar collectors in some districts may be counted toward the required open space. SMC Title 23, Sec. 43.040B and Sec. 45.545.B ▪ Portland, OR, permits accessory solar energy systems in accordance with design standards. Ch. 33, Title 218, Sec. 100.N, P.8; and Title 218, Sec. 110.N, R.9 ▪ Berkeley, CA, permits solar energy equipment to exceed the height limit and encroach in required yards with and administrative use permit. Sub-

RENEWABLE ENERGY		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
		Title 23D, Ch. 04, Sec. 030.G ▪ Miami, FL, in most cases, solar energy collectors and similar equipment required to operate and maintain the building do not have to comply with building height limitations. Art. 3, Sec. 5.3 ▪ Fort Collins, CO, promotes energy conservation by not allowing prohibitions or limits to be set on solar collectors, clothes lines, and compost bins.
RE-B.2: Strict nonconforming use/structure requirements discourage "green" building renovation/expansion.	Allow renovations/expansions related to "green building" (e.g., adding solar panels, insulation, etc.) to take place without bringing entire site into compliance or allow expansions that reduce the degree of nonconformity or do not increase it to proceed without full compliance.	▪ Salt Lake City is adopting provision allowing "green building" improvements to nonconforming uses/structures without full site compliance. ▪ Many mature communities allow expansion of nonconforming uses/structures if the expansion does not increase the degree of nonconforming.
RE-B.3: Historic preservation design guidelines relating to solar systems on roofs may inhibit installation.	▪ Adopt clearer hierarchy of preferred locations for solar on historic sites. ▪ Allow on front roof under some specified circumstances with provisions to ensure compatibility.	▪ State of California forbids absolute prohibitions of solar on roofs of historic structures. ▪ Miami, FL, permits solar panels in the neighborhood conservation districts as long as they do not exceed 3 feet above the roof and do not cover more than 10% of the roof structure. Art. 3, Sec. 6.K.4 ▪ Salt Lake City is adopting a hierarchy of preferred locations for solar on historic sites, but may be allowed on front yard roofs as last resort.

RENEWABLE ENERGY		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
RE-B.4: Zoning code does not address other renewable energy systems such as wind energy conversion systems (WECS), ground-source heating/cooling systems, etc. as principal or accessory uses.	▪ Add provisions allowing solar and small WECS in specific districts subject to clear standards relating to height, noise, and other potential off-site impacts. ▪ Review potential standards to permit ground-source heating and cooling systems.	▪ Portland, OR, defines "Small Scale Energy Production" where energy is collected from solar, wind, geothermal, and more. This is considered a basic utility use and is allowed in most districts as an accessory use. E.g., Ch. 33, Title 130, Sec. 100.B.10.b ▪ Nevada, IA, allows WECS by right in all industrial districts and by special use permit in all other districts subject to performance standards. Ch. 165.09 and Ch. 165.16(9B) ▪ Anchorage, AK, allows small WECS with limits on setbacks, height, noise, etc. ▪ Portland, OR, allows small, urban-scale wind turbines in accordance with size, locational, and noise standards. Ch. 33, Title 299 ▪ Chicago, IL, allows rooftop wind turbines as a permitted accessory use, subject to setback and noise limitations. Title 17, Ch. 17, Sec. 0311.B.4 ▪ Centennial, CO, allows small wind turbines by right in zoning districts following clearly written design standards that address impacts. Article 3, Division 6, 0.3.607.D ▪ North Dakota requires a permit for all nonresidential geothermal projects (permitting them without a permit for private residential uses) to ensure proper design and construction and to minimize risk of environmental problems.
Building Code		
RE-B.5: According to stakeholders, the permitting process for solar PV installations lacks predictability in cost and time required, and whether structural en-	Review the solar PV and solar thermal permitting and inspection processes to further streamline permitting through a process involving solar vendors and installers. Consider	▪ Maricopa Association of Governments in Arizona created uniform procedures for securing necessary electrical/building permits for residential (single-family) and commercial PV systems although local zoning

RENEWABLE ENERGY		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
gineering will be required. Additional issue with potential for solar installations to void roof warranties.	creating a standard package of requirements, guidelines, with tiers clearly delineated and inspection checklist. . Routing through the permit review process should only go to those departments directly affected. Follow-up inspection after installation is complete and in operation is recommended as well. Hands-on educational course for staff, system designers and contractors is recommended. Additionally, the County could lead an effort to standardize solar permitting in all municipalities.	regulations may apply. ▪ Three excellent resources for upgrading the permitting process for renewable energy projects are: http://www.cleantechsandiego.org/news-and-events/industry-reports.html and their report - "Taking the Red Tape Out of Green Power: How to Overcome Permitting Obstacles to Small-Scale Distributed Renewable Energy" - http://www.cleantechsandiego.org/reports/redTape-rep.pdf and http://www.solarabcs.org and their report -"Expedited Permit Process for PV Systems" - http://www.solarabcs.org/permitting, and a new report, "The Impact of Local Permitting on the Cost of Solar Power." http://www.sunrunhome.com/uploads/media_items/solar-report-on-cost-of-solar-local-permitting.original.pdf
RE-B.6 Building codes (coupled with zoning) do not address district heating and cooling to the extent that these systems can be installed with predictability and more commonly.	Explore opportunities for removing barriers to district heating and cooling and combined heat and power systems, including code provisions and use of public right of way.	▪ City of North Vancouver, BC, adopted Hydronic Heat Energy Bylaws to create district heating/cooling service for Lonsdale area requiring new and retrofitted buildings to connect and use system. www.toolkit.bc.ca/success-stories/district-heating-north-vancouver. ▪ The U.S. EPA also publishes useful information regarding district heating and cooling systems. http://www.epa.gov/chp/events/webinars.html

RENEWABLE ENERGY		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
RE-B.7 Codes do not include provisions for experimental or innovative technology projects.	Develop a formal process for experimental and innovative application of new technologies in response to county goals to reduce energy use, reduce green house gases, decrease fossil fuel dependence, and raise community and industry awareness.	Seattle and Clark County, WA, Living Building Challenge allows for new technology and practices to be implemented to achieve higher levels of energy efficiency, GHG reductions, and improved livability. (See related recommendations in the Permitting/Plan Review/Inspection section of this diagnosis.)
RE-B.8: High-velocity wind area requirements pose an continuing challenge to renewable energy installations on buildings (solar electric and solar thermal systems as well as wind turbines).	The state and county requirements related to high winds add an additional layer of complexity to permitting for building-mounted or integrated renewable energy systems. Convene a process to bring stakeholders together to assess and address issues related to high wind and installation and maintenance of renewable energy systems.	
CREATE INCENTIVES		
RE-I.1: County code does not contain any incentives for renewable energy installations.	Consider offering building and zoning permit fee waivers or rebates for renewable energy system installations.	▪ States of California and Colorado place limits on the amount of local fees that can be imposed on permits for domestic solar energy systems. ▪ Sarasota County, FL, is currently offering rebates and low-interest loans to residents who upgrade their properties with energy saving technologies under the new Get Energy Smart Retrofit rebate program. www.scgov.net/retrofit/ ▪ Tucson, AZ, has adopted a tiered solar fee waiver for projects that incorporate solar thermal and voltaic systems. ▪ Henderson, NV (Sec. 19.7.12), and Eagle County, CO, grant points in their sustainability point review systems for incorporating renewable energy sources.

RENEWABLE ENERGY		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
FILLING REGULATORY GAPS		
RE-R.1: Zoning code does not address renewable energy systems in definitions, permitted and accessory use provisions, and dimensional standards (height, setbacks, etc.).	Incorporate separate definitions and performance criteria for different types and scales of renewable energy facilities (e.g., non-commercial) to explicitly address where these various types may or may not be appropriate. Establish size thresholds and height requirements. Allow systems in side and rear yards by right.	▪ Portland, OR, defines "Small Scale Energy Production" where energy is collected from solar, wind, geothermal, and more. This is considered a basic utility use and is allowed in most districts as an accessory use. Ex: Ch. 33, Title 130, Sec. 100.B.10.b ▪ Denver, CO, permits solar and photovoltaic energy systems as an accessory structure subject to the building form standards for accessory structures. ▪ Seattle, WA, permits by-right solar collectors, solar greenhouses, and other solar devices as an accessory use with specific design criteria for each district. The area covered or enclosed by solar collectors in some districts may be counted toward the required open space. SMC Title 23, Sec. 43.040B and Sec. 45.545.B
RE-R.2: The zoning and subdivision codes do not contain any provisions addressing solar access.	Consider adding provisions addressing solar access and a formal process for protecting solar access.	▪ Henderson, NV, grants points in its sustainability point review system for proper solar orientation. Sec. 19.7.12 ▪ Boulder, CO, has detailed solar access review for every development to protect adjacent solar "envelope". Title 9, Ch. 9, Sec. 17 ▪ Laramie, WY, allows registration of solar panels that triggers protection. ▪ See Kettles, *A Comprehensive Review of Solar Access Laws In Use And Suggested Standards For A Model Ordinance.* For Link, see footnote. [27]

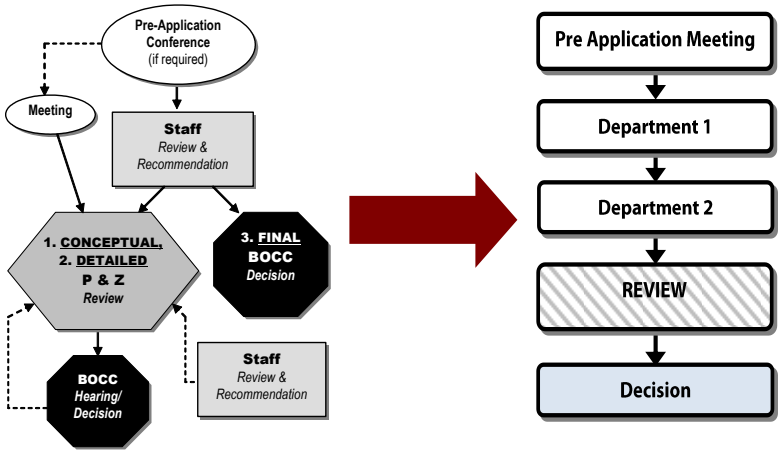
[27] http://www.solarabcs.org/solaraccess/Solaraccess-full.pdf

RENEWABLE ENERGY		
EXISTING PROVISIONS	**POSSIBLE REVISIONS**	**EXAMPLES/BEST PRACTICES**
RE-R.3: No mandatory minimum percentage of energy generation from alternative sources for buildings/developments.	Require minimum alternative energy % generation or purchase or GHG reduction. Consider implementing as part of broader sustainability "scoring" system use in several communities.	▪ Henderson, NV, awards 5 points in sustainability point system if 20% of energy is generated on-site from renewable sources. 3 points if off-site. Sec. 19.7.12 ▪ Tucson, AZ, requires all new homes to be "solar ready" with electrical and plumbing systems stubbed in place to accommodate solar systems. ▪ LEED-ND awards 1 point if 5% of energy is generated from renewable sources.
RE-R.4: No requirements in zoning or subdivision codes regarding solar-oriented lots and subdivisions.	Consider requiring minimum percentage of lots in larger subdivisions to be solar oriented (i.e., longer east-west axis to provide more exposure to sun).	▪ Fort Collins, CO, requires 65% of 15,000 sq. ft or greater residential lots to be "solar-oriented". ▪ Portland, OR, requires single-dwelling detached development as part of a land division proposal to have good solar access by regulating the width of the lots based on the angle of the frontage street. Ch. 33, Title 639 ▪ Multnomah County, OR, and Ft. Collins, CO, require 20-30% of lots in new subdivisions to be solar-oriented. ▪ LEED-ND awards point for solar oriented building or block design. ▪ Glenwood Springs, CO, requires a minimum of 50% of lots in non-infill single-family subdivisions to have a north-south dimension of 90 feet or more; and to have a front lot line that is oriented within thirty (30) degrees of a true east-west axis. Residential Design Standards III.A.9

PERMITTING/REVIEW PROCEDURES

Introduction

As discussed in the introduction to this Diagnosis, the primary focus of this project is on substantive changes that can be made to the county's development and building codes to promote county sustainability goals in three main areas: energy efficiency and conservation, greenhouse gas reduction, and renewable energy. The preceding sections of the Diagnosis have identified numerous changes, both major and minor, that the county should consider.



However, in the course of interviewing county staff and stakeholders who have hands-on experience with the county development and building review process, we heard loud and clear that development processing and permitting issues were every bit as important as substantive changes to the development and building codes. Interestingly, we heard that the most significant procedural snags in the system were often not in the zoning and building code review areas. Indeed, the planning and zoning department staff were commended by many in the development community for being flexible in working with applicants to promote "green" sustainable projects. This issue is not news to county staff. Over five years ago the county created a development coordinator's position in the county's manager office in response to a study of the development review process. The development coordinator assists applicants to navigate the review process, helps facilitate large projects (e.g., the Florida Marlin's new stadium), and works to ensure a customer-friendly land use and building approval process. The set of flow charts developed for this process are among the most thorough and comprehensive we have seen, enabling a more systemic approach to approvals than most jurisdictions. The county by ordinance has also established maximum review times for all projects.

Because the consulting team feels that these development review process and permitting issues are important for the county to address on an equal footing with our recommended substantive changes, we have added this section to the Diagnosis. We have broken down our observations and recommendations into seven broad categories:

1. Solar system permitting
2. Expedited green permit process
3. "Green Building" education of plan reviewers, inspectors, and contractors
4. County/State product testing
5. Actual versus designed green buildings
6. Living building challenge option
7. Zoning code public participation

SOLAR SYSTEM PERMITTING

According to stakeholders we interviewed, the building code permitting process for solar photovoltaic installations lack predictability. They asserted that requirements, costs, and time for review can vary each time a building permit is sought. Moreover, they stated that permits are sometimes referred to other county departments for review that have no real substantive expertise or interest. Greater coordination of the various permitting staff – structural, mechanical, and electrical – is key to making a process for solar installations more efficient from permit intake to final inspection. There was also a consensus among county staff and stakeholders that the county should sponsor more educational training on solar systems both for review and inspection personnel as well as contractors doing the installations. Based on this commentary and our experience with solar system review in other progressive jurisdictions,[28] we suggest the county consider the following process improvements:

- Review the solar PV and solar thermal permitting and inspection processes to further streamline permitting through a process involving solar vendors and installers. Consider creating a standard package of requirements, guidelines, with tiers clearly delineated, inspection checklist.
- Routing through the building code permit review process should only go to those departments directly affected.
- Create a follow-up inspection process after solar pv installations are complete and in operation. Violations need to be corrected.
- More hands-on educational workshops on solar technology and trends, key installation issues, etc. for staff, system designers and contractors.

EXPEDITED GREEN PERMIT REVIEW PROCESS

The county has put in place an innovative expedited permit program for "green buildings." The process is codified in Sec. 8-6 of the county code:

> It is the intent of Miami-Dade County to promote environmentally sensitive design and construction. To that end, the Building Official shall implement a program to expedite the review and approval of permit applications for green buildings. As used in this Section a green building shall mean one whose design, construction, and operation promote the preservation of resources and environmentally sensitive construction practices, systems and materials. In making the determination of whether the structure is a green building, the Building Official shall rely on the review, evaluation and where available registration or certification of the design by recognized environmental rating agencies including the Florida Green Building Coalition, the National Home Builder Association and the U.S. Green Building Council. The green buildings program shall be implemented through administrative order to be approved by the Board of County Commissioners.

[28] Two excellent resources from the City of San Diego for upgrading the permitting process for renewable energy projects are: (1) http://www.cleantechsandiego.org/news-and-events/industry-reports.html and their report - "Taking the Red Tape Out of Green Power: How to Overcome Permitting Obstacles to Small-Scale Distributed Renewable Energy" and (2) http://www.cleantechsandiego.org/reports/redTape-rep.pdf
and http://www.solarabcs.org and their report -"Expedited Permit Process for PV Systems" - http://www.solarabcs.org/permitting.

While according to stakeholders, the process works well, it is not well-known and there are a number of improvements that could be made to make it more effective:

- The county should take steps to more broadly publicize this important program. It is difficult to find information about it on the county's web site. The county should consider creating a highly visible, clearly described web portal to this program to make it easy to find, understand, and use.
- The ordinance is directed at the building official and building department. Reportedly, not all county departments are subject to the accelerated permitting requirements nor do some feel obligated to expedite green building reviews. For example, Chapter 24 of the county code, which is the "bible" for the Department of Environmental Resources Management, does not contain any requirement for expedited processing, although staff state that they do expedite green building reviews. Moreover, not all of the seven departments involved in the permitting process offer the Optional Plan Review that allows applicants to pay a fee for expedited processing of any project. The county should explore these issues further and if necessary address them either by administrative directive or county code amendment.
- The expedited green building review applies only to initial construction, not to subsequent tenant improvements. Stakeholders urged the county to consider granting "green buildings" permanent status so that tenant improvements made in the future, that maintain or improve the "green" performance of the building, also get automatic expedited permitting.
- Explore using the International Green Construction Code (IGCC) as the standard for buildings to qualify for expedited green building permitting. Another option would be to also require that all residential developments and structures that seek expedited green building review must use solar thermal systems if feasible. This would, in effect, create a "stretch" green energy code that goes beyond the state building code requirements through use of an incentive system. Consider as an added bonus extending the expedited permitting to later tenant improvements for buildings meeting the IGCC.

"GREEN BUILDING" EDUCATION OF PLAN REVIEWERS, INSPECTORS, AND CONTRACTORS

A nearly universal observation from city staff and stakeholders alike was the need for continuing education and training for permitting, plan review and inspectors to ensure that they (1) understand the county's goals related to sustainability, green building, climate mitigation and adaptation, energy efficiency and conservation, renewable energy, and water efficiency and re-use, and (2) are familiar with the latest trends and technologies in these areas as it applies to their duties. These workshops also need to be offered to contractors as is done in some jurisdictions such as Pitkin County, Colorado. Green technology experts that the consultants interviewed also suggested that hands-on checklists should be developed for inspectors to make clear to them exactly what they need to inspect for with regard to specific green systems (such as solar).

Another related topic we heard about was reported staff resistance to approving innovative "green building" approaches, materials or systems because of perceived jurisdictional or personal liability. In addition to more educational programs for staff, we suggest the county consider developing a formal protocol for a "hold harmless" or waiver of liability process to allow project owners to relieve the county from responsibility for certain innovative or experimental projects, designs, systems, products or materials they might desire to employ.

COUNTY/STATE PRODUCT TESTING AND APPROVAL

Because of the danger and damages associated with high-wind velocities from hurricanes, the State of Florida and Miami-Dade County have adopted a unique "product testing" requirement. Certain building products (like curtain walls, doors, windows, shutters, as well as exterior wall and roof assemblies) must be tested and approved according to specific protocols related to impact resistance, cyclic wind pressure, and similar issues.

We heard from a number of developers, architects, and other building professionals that the county/state product approval process may inhibit the introduction of more sustainable innovative designs, materials, systems and approaches—even though the county is striving to encourage and implement changes in support of energy efficiency, renewable energy and climate change goals. Interviewees said this was especially true for green systems that are composed of off-the-shelf components such as roof-top rainwater harvesting and storage systems combining mainly off-the-shelf components and products from different manufacturers, or for the use of traditional or natural materials that are not supplied by industry, such as earthen materials for systems like rammed earth.

One suggestion we heard was that the county, potentially in collaboration with the state, consider developing a formal process for experimental projects to enable innovation and experimentation in response to other county goals such as energy efficiency and renewable energy production. Because the consulting team is not intimately familiar with the product testing system, we can only recommend that the county convene a group of experts and customers to explore this issue further as it clearly has and will continue to have a significant impact on the county's green building efforts.

ACTUAL VERSUS "AS DESIGNED" GREEN BUILDINGS

Given the state legislation that severely limits the county's ability to adopt more stringent building energy requirements than the Florida state energy code, one of the most potentially important avenues to reduce energy consumption in buildings is to improve building performance through more robust and thorough enforcement of the existing building code energy regulations both for new and renovated buildings. There are many efforts underway in other communities to focus on such "outcome based" energy codes that allow jurisdictions to require owner's or operators of new or significantly remodeled buildings to submit utility records showing actual energy consumption on an annual basis to assess whether the new buildings are actually delivering the energy performance they were designed and to achieve and granted approval based on such performance.

We heard from several interviewees that in terms of enforcement of the state energy code, permit applicants sometimes "submit plans and then build something different. There is no follow-up by the county to ensure compliance." The particular issue they were focusing on, as we understand it, relates to the state's energy modeling software program, which is a "pass-fail" system; however, there is no mechanism to ensure that the same design and specified components that passed the modeling program are then installed. The energy models are often complex and the specific elements that worked for the passing design often involve window glazing types, mechanical equipment and more, which may or may not be readily available to the inspector on site. There is a need to ensure that the specific details, products, or performance ratings of products that were approved are all included in the plans and specifications on the project site, so inspectors can verify that what was approved is what is installed.

Given the limitations in state law and the possibility that what is being built is different than what has been designed with regard to building energy-saving features, we recommend that the county explore

the potential to enact a pilot program to monitor "actual" versus "designed" energy performance of new buildings as an initial step to achieving energy and GHG reduction targets.[29] The county might also explore opportunities to improve the way energy codes address existing and historic building energy performance. A good discussion of the issues and opportunities can be at: http://www.newbuildings .org/sites/default/files/ACEEE_2010_Denniston_0.pdf

LIVING BUILDING CHALLENGE OPTION

The Living Building Challenge (LBC)[30] is the most comprehensive and aggressive certification program for the built environment currently in use in North America. The LBC seeks to encourage the advancement of building and development practices toward restorative and regenerative goals, not merely limiting harm and damage from built projects. Through a cooperative initiative of the International Living Building Institute and several jurisdictions in the Pacific Northwest, a series of research projects was carried out to evaluate the regulatory challenges faced by projects striving to attain Living Building certification. These are available along with additional information on the websites of both the City of Seattle and Clark County, Washington. As a result of this research and the desire to have such innovative projects built in their jurisdictions, Seattle and Clark County enacted ordinances granting regulatory flexibility for a fixed number of projects officially seeking Living Building certification within a fixed number of years.

Seattle's Living Building Pilot Program allows up to 12 projects over a three-year period, and Clark County's Sustainable Communities Ordinance Pilot allows up to 6 projects over five years. The increased flexibility is both for land use and building code provisions including reductions in allotted space for parking, alternatives to impervious surfaces, reduced setbacks for rainwater harvesting cisterns or the inclusion of composting toilets, adjustments to permitted accessory uses, height, and floor area ratio (FAR), and others deemed consistent with the goals of the pilot projects and the jurisdictions.[31]

We suggest that the county review these ordinances and policies both in terms of applicability and desirability and explore a similar ordinance that will encourage more comprehensively sustainable projects, offering a research and learning opportunity for all involved to improve the regulatory processes governing built projects in Miami-Dade County by creating a pilot program giving the building and planning and zoning departments authority for greater flexibility in approving a certain number of Living Building projects to better understand the regulatory issues that may need to be addressed for such projects to become more common in the county.

[29] For a discussion of this concept from the New Buildings Institute, see http://www.newbuildings.org/sites/default/files/Future_of_Codes-ACEEE_Paper.pdf and http://www.newbuildings.org/out-come-based-energy-codes.

[30] http://ilbi.org/

[31] The ordinances as well as more information about what they cover can be found here:
City of Seattle: http://www.seattle.gov/dpd/Permits/GreenPermitting/LivingBuildingPilot/default.asp
Clark County, Washington: http://www.clark.wa.gov/environment/sustainability/communities.html
http://www.clark.wa.gov/environment/sustainability/docs.html and City of Portland Alternative Technical Advisory Committee, http://www.portlandonline.com/bds/index.cfm?c=48661

In addition, the City of Seattle and Portland, Oregon, have also developed more formal processes to encourage the introduction and successful implementation of innovative sustainable practices, involving advisory committees to assist and support regulatory staff in reviewing and approving such practices.[32]

ZONING CODE AND COMMUNITY PARTICIPATION IN DEVELOPMENT APPROVALS

A number of large cities and counties have created neighborhood or community councils to provide input in and sometimes approval of local development applications. In Miami–Dade County, community councils were primarily created to make zoning and land use decisions in a setting more accessible to the community. They also serve as advisory liaisons from their communities to the Miami-Dade Board of County Commissioners (BCC) and county staff, relaying relevant information and recommendations on selected concerns of the council area. Councils usually meet once a month to discuss zoning matters and every other month to address non-zoning issues. Each council serves one of ten geographic areas in unincorporated Miami-Dade County and is comprised of six members elected by the community and one appointed by the BCC. All members must be registered voters and reside in the area that they represent. Unlike community councils in most other cities, those in Miami-Dade County have actual authority to approve or disapprove development applications, zone changes, and use variances. Certain of their decisions can be appealed to the BCC.

We heard from most development professionals that we interviewed that the community council zoning review process was time-consuming and that sustainable, green projects (for example, mixed-use developments with higher densities and sustainability features) did not receive any special consideration despite the fact that they are advancing county sustainability goals. Interviewees maintained that the community councils are, quite naturally, more focused on local neighborhood issues and impacts, not county wide sustainability goals or considerations. Their suggestion was to make more mixed-use projects by-right without having to go through the community councils or public hearings.

We hear this same suggestion regarding citizen participation and public meetings from development professionals in many communities where we work. Certainly having clearer development standards that are better tailored for infill and redevelopment as recommended in earlier sections of this diagnosis will help. But since these projects are often a new form of development in an area and often call for greater height and density, few communities have taken the step of making them by-right without public hearing review except for smaller, straightforward projects. And because the community council system is well-established in Miami-Dade County, it is probably not likely that “green” developments would be exempted from normal community council review.

However, it may be useful if county staff and county elected officials hold meetings and workshops with community council elected members and zoning board representatives to discuss the county’s sustainability goals and how mixed-use and other “green” developments involving features like solar systems are critical to achieving those goals. Hearing from community leaders and elected officials about the importance of supporting county-wide goals and innovate green building projects may help create a more receptive atmosphere for these important developments.

[32] More information about the City of Seattle Innovation Advisory Committee can be found at http://www.seattle.gov/dpd/Permits/GreenPermitting/InnovationAdvisoryCommittee/default.asp

Project Testing Report

As part of the project scope, the consultant team interviewed four developers and tested their "green building" projects to understand the on-the-ground ramifications of Miami-Dade County's existing development and building codes. The interviews also allowed the consultant team to verify whether the findings in the Code Diagnosis Report (CDR) were borne out in actual practice. Testing the projects in this way provided a practical perspective about the realities of development in Miami-Dade County. The developers were chosen, with staff assistance, because they have completed green buildings or projects in the County and could provide useful feedback regarding the strengths and weaknesses of the existing development and building codes. This section provides a summary of those interviews, particularly as they relate to the major findings of the CDR, as well as the responses from the County staff after reviewing an initial draft of the project testing report. Overall, the testing confirmed some of the key observations in the CDR and revealed other issues the County should consider in evaluating potential development code amendments.

PROJECT 1: SUNRISE COMMONS (26600 SW 146TH COURT)

Alex Barroso of Landmark Development Corporation (Landmark) provided information about Sunrise Commons, a five-story mid-rise building with 106 residential units. The building is a mix of one, two, and three bedroom units with a density of approximately 48 units per acre, located adjacent to the South Miami-Dade busway. Federal low-income housing tax credits provided a majority of the financing; the remainder came from a conventional permanent loan from Neighborhood Lending Partners. Landmark, which does almost all of its development work using LIHTC, has been in business about 20 years.

Sunrise Commons is located in the Naranja area, in the southern part of unincorporated Miami-Dade County. The area was previously zoned for agricultural and industrial uses and was the subject of a small area plan or charrette conducted by the County in 2001. The area is also designated as a community urban center in the County's Comprehensive Development Master Plan (CDMP) and as such eligible for transit-oriented type of development.

The collaborative effort between the County and the Naranja community resulted in a charrette report that guides growth of the area and subsequent land development regulations. Sunrise Commons was the first new development in the area under the new regulations; another development with 500 units is currently being constructed within five blocks of the site. The new regulations, known as the Naranja Community Urban Center Zoning District (NCUCD), designate the Sunrise property as Residential Modified (RM, a multi-family residential district) and Mixed-Use Corridor (MC) which allows for buildings to be 100% residential.

Sunrise Commons is a residential building with the exception of some ground-floor support uses, such as an office, computer lab, gym, and laundry. Sunrise Commons has achieved LEED Silver status by incorporating such elements as dual flush toilets, low-flow fixtures, preferred parking for hybrid cars, a reflective white-colored roof, a high-efficiency HVAC system, and a low-power elevator. All of these features were allowed as-of-right; no special permits or variances were required.

Renewable Energy

Photovoltaic panels were considered but were not included in the building plans due to financial concerns. The Code Diagnosis Report (CDR) reveals that the current zoning code is silent on solar systems for renewable energy as permitted accessory uses or HVAC equipment, which could also be a deterrent to including them in building design. The high cost of photovoltaic panels was cited by three of the developers, which supports the need for incentives to install renewable energy systems, as suggested in RE-I.1 in the CDR. These two strategies together could encourage the use of renewable energy systems (and particularly solar energy) by making it a code-supported option that could be made less expensive through fee waivers or rebates.

State law prohibits local ordinances from forbidding the installation of renewable energy systems, but it does allow for reasonable restrictions. The County should put specific standards in place to better regulate the location, size, and other requirements related to renewable energy systems.

Water Conservation

To conserve water, Sunrise Commons is landscaped with plants and an irrigation system that uses 50% less water than conventional landscape would require. There is no retention or storage for stormwater on site; French drains are used to allow water to be filtered into the ground. To protect groundwater in the County-designated well field in which the project is sited, the Department of Environmental Resources Management required that the on-site back-up generator be powered by propane instead of diesel fuel.

Impervious Surface

Landmark was required to dedicate 13 feet along the property line on SW 146th Court of the Sunrise Commons property to the public right-of-way, built to County standards. Based on site plan drawings of the project, this 13 feet was used to provide sidewalk and parkway space to increase the pedestrian friendliness of the area. It does not appear as though the driving lane widths were increased. Landmark was also required to increase paving area on site to accommodate the Fire Department's request for a larger y-turn area.

Expedited Permit Process and General Suggestions

Landmark used the expedited permit process for affordable housing during the development of Sunrise Commons, not the expedited permit process for green buildings. Regardless, they felt it did not have much positive impact on the process. They suggested that the best way to improve the permit process would be to fully digitize it, which the county has implemented through its Concurrent Plan Review Process (CPP). CPP, implemented on February 28, 2008, allows construction documents and permit applications to be submitted in electronic format (or converted by the department) and sent simultaneously via an automated workflow to the seven different departments required to review and approve plans prior to permit issuance. This process is mandatory for residential additions, alterations, fence repairs, and pools as well as commercial alterations less than $100,000 in value. CPP is optional for all other types of construction, including new construction. It is the Building Department's preference that projects be submitted in electronic format; however, there seems to be reluctance from industry members to do so. The site plan review application for this project was received December 6, 2007, a few short months before the CPP was implemented.

County Response

The project submitted by this applicant is classified commercial. The time from permit application acceptance to permit issuance was 155 days. The average cycle time for commercial projects (permit application to issuance) at that time was 179 days. This applicant saved 24 days by using the expedited process.

It should be noted that the 155 days include 62 days that the plans were with the applicant/design professional to answer plan review comments. Therefore the processing time with the Miami Dade County was 93 days. For C2008127561, DERM reviewed plans four (4) times for a total of 18 days.

PROJECT 2: BROWNSVILLE TRANSIT VILLAGE (5200 NW 27TH AVENUE)

Najee Coverson and Chris Peterson of Carlisle Development Group (Carlisle) provided extensive information about all five phases of Brownsville Transit Village (BTV). Carlisle is the largest developer of affordable housing in the state of Florida; the majority of their projects are located in Miami-Dade and Broward Counties. They have 8,000 units either completed or in-progress. Carlisle has been in existence since 1998.

BTV is a transit-oriented development project set on a former Metrorail parking lot adjacent to the Brownsville Metrorail Station. The County acquired the land approximately eight years ago, and Carlisle is a sub lessee of TWUCSI, the non-profit partner that oversees the property. BTV is located between the cities of Miami and Hialeah, in unincorporated Miami-Dade County. Currently, four of the phases are underway: phases I and II began in June of 2010 and phases III and IV began in December of 2010. The site is just under nine acres with 466 units planned, resulting in a residential density of 46-62 du/acre depending on whether the square footage of open space is included in the calculation. Each phase includes 1,800 square feet of retail for a total of 9,000 square feet of retail throughout the completed project. Buildings range in height from eight to fourteen stories for a total of approximately 531,000 square feet of building space. Phase I will include childcare, phases II-IV will include commercial uses to serve the transit station, such as food service and small retailers, and later phases will include space for non-profit offices.

The surrounding Brownsville neighborhood is primarily a single-family neighborhood, housing an older population. All of the units are being rented at affordable rates, at 66% of area median income or less. All of the units have been claimed in advance of the project's completion, and there are nearly 200 people on the waiting list. Carlisle reported that they provided affordable units due to the Low Income Housing Tax Credit, and not because of the RTZ requirement.

Renewable Energy and Water Conservation

Carlisle has set a goal of LEED Silver for BTV, which will be attained by incorporating low-flow fixtures, using recycled materials, diverting approximately 75% of construction waste from landfills, relocating existing trees, using native plants, achieving high-efficiency ratings for windows and HVAC systems, and installing solar-powered lighting outdoors. All of these were allowed as-of-right by the codes and did not require special permits or variances. Carlisle considered a 25-kilowatt photovoltaic system on the roof of the parking garage, but has decided not to install it because it is currently not financially feasible. Carlisle has not requested approval of the photovoltaic system; however, as stated above, the County could

have a major impact on the use of solar energy systems if it specifically allows them in the zoning code and encourages them through incentives.

Impervious Surface

Carlisle reported very few barriers to building a green and transit-oriented development. They reported some challenges from the Public Works Department when seeking approval for their parking garage. Wide and more costly street-like turning radii were required internal to the parking garage, but with no explanation given. Carlisle complied with the request, which resulted in a parking garage with a larger footprint than they felt was necessary.

The CDR points out that parking standards are more appropriate for suburban development, and that the Fire and Public Works Departments do not allow for narrow lane widths. (See EC-B.1.) Carlisle's experience with their parking garage seems to illustrate this point well.

Requirements of the Rapid Transit Zone, Model City Urban Center District, and Standard Urban Center District Regulations: Workforce Housing

BTV is currently zoned as RTZ, a zoning district applied to the County's rapid transit stations, and the property is also located inside the adopted, but has not yet been rezoned to, the Model City Urban Center Zoning District (MCUCD). The property is also subject to the Standard Urban Center District (SUCD), a zoning designation recommended by the Comprehensive Development Master Plan to support highly accessible urban centers. Certain provisions of the RTZ, MCUCD, and SUCD districts deserve further consideration for use elsewhere in the County, because the districts includes language about mixing uses, workforce housing, and pedestrian connections. If a development within an RTZ, MCUCD, or SUCD district is to include more than four residential units, for example, the Code requires that a minimum of 12.5% of those be dedicated to workforce housing units. In the MCUCD, this requirement can also be met by providing a minimum of 10% of the units as affordable, which is defined as being restricted to households whose income range is up to 80% of the County median income. Workforce housing units are reserved for households with income between 65% and 140% of area median income for the County. Providing workforce housing is an important aspect of securing the long-term sustainability of neighborhoods, and most communities struggle filling the shortage of affordably priced housing provided by the market. The County should consider broadening the workforce or affordable housing requirement to other zoning districts.

Requirements of the RTZ: Use Mix, Pedestrian Connection, and Parking

Development in the RTZ must have a minimum of two uses. To address the lack of minimum mix of uses standards pointed out in EC-R.1 and GG-R.3 in the CDR, the County could consider expanding the required use mix in the RTZ to other areas. This type of use mix calculation could be adapted for other zoning districts, where appropriate.

The RTZ development standards could also prove helpful in addressing pedestrian connectivity issues as described in EC-R.2 and GG-R.4 of the CDR. The RTZ requires generous pedestrian passages into the development to encourage access to the site. Pedestrian paths are also required to provide linkages between the train station and the adjacent neighborhoods. Similar language could be used in other districts to require pedestrian connectivity to make walking safer and more comfortable.

It appears as though the parking standards in the RTZ are the same as other zoning districts; there is no automatic reduction for being close to transit as recommended in the CDR. Neither the RTZ nor the code

as a whole address bike parking in detail, as pointed out in the CDR. The County should consider adding bike parking requirements, especially in areas near transit stations.

Staff points out that this project was done during a transition period and therefore it has components from both the MCUCD and RTZ; however, MDC P&Z asked the developer to align the project along the newer regulations in the MCUCD given that they are more sensitive to surrounding areas than RTZ

Expedited Permit Process and General Suggestions

Carlisle tried to use the affordable housing expedited permit process for BTV, but felt it did not work. Due to difficult economic times, the County had to lay off reviewers, so there was not enough staff to expedite specific projects. They had some leeway because they were working on County property, but it still took six-to-eight months to permit each phase of the project. Carlisle thought electronic submissions could help streamline the process, but found major resistance to digital filings from the County recently.

The MCUCD and SUCD appear to leave out some key components to the RTZ, especially as related to use mix and pedestrian connectivity, briefly described above. Section 33C-8(C)(1) states "a minimum of two of the following uses shall be included in all Rapid Transit Zone Station development: (a) Business and civic uses…(b) Residential uses…(c) Housing for the elderly." Neither the MCUCD nor the SUCD include language requiring a mix of uses. Only a list of permitted uses is included.

The MCUCD includes a New Streets Plan, indicating the location of A and B streets, but there are no specific requirements related to the frequency of pedestrian pathways and connections. Section 33C-8(12) of the RTZ states that "a pedestrian passage shall be required every 400 linear feet of street frontage to allow public access through the site. The passage shall be minimum unobstructed 8' wide." Further in that same section of the code, the following requirement is found: "All developments shall have sidewalks or pedestrian paths a minimum 8' wide providing pedestrian linkages between the transit station and anticipated destinations in the Rapid Transit Zone and the adjacent neighborhoods."

A vibrant mix of uses and a strong pedestrian network are pivotal aspects of creating a thriving, walkable neighborhood. The County is in the process of adopting the MCUCD as a replacement for the RTZ, and risks losing these important requirements in so doing. Not only should the County reconsider whether they want to revise the MCUCD and/or the SUCD to address use mix and pedestrian connectivity, the language of the RTZ should also be considered for other zoning districts where walkability is of high value.

County Response

The regulatory framework under which the project was conceived and reviewed became somewhat challenging and unique. Once rezoned, MCUCD would replace RTZ, but the County and developer agreed that the project would be reviewed under both the RTZ and the MCUCD. This project was unique and from now on project in this area would have to follow the new regulations "Model City".

This project took advantage of both the expedited process and the Concurrent Plan Review Process. As explained, above the CPP System allows construction documents and permit applications to be submitted in electronic format (or converted to electronic format by the department) and sent simultaneously via and automated workflow to the seven different departments required to review and approve the plans prior to permit issuance. CPP definitely streamlined the process by allowing plans to be reviewed simultaneously. The Department is aware that due to the size and complexity of the project the Fire

Department requested in addition to the electronic submittal a hard copy of the drawings to assist them in their review. As stated above the Building Department prefers that drawings be submitted in electronic format.

As part of the expedited process this project had the benefit of two rework meetings attended by multiple disciplines to review and clarify plan review comments.

The project submitted by this applicant is classified commercial. However, the project size and complexity (multiple buildings with multiple occupancies) required more review time than the typical commercial project. Never the less it was reviewed in less than the departments overall review time for projects of smaller size and complexity. The time from permit application acceptance to permit issuance was 173 days this includes 44 days that the plans were with the applicant /design professional to answer plan review comments. Therefore, the processing time with the Miami Dade County was 129 days. For C2010083553, DERM reviewed plans five (5) times for a total of 25 days. Note that site was identified as contaminated and therefore included reviews to address impact to stormwater management system.

PROJECT 3: THE GREEN HOUSE IN KENDALL (7998 SW 98TH TERRACE)

Albert Harum-Alvarez is both the homeowner and builder of The Green House in Kendall, a 2-story, 2,300 square foot (excluding porches and cellar) single-family home. The zoning classification of the property is EU-M, Estate Modified. Mr. Harum-Alvarez has worked in the construction industry as a carpenter, but building is not his profession. Construction began in 2006 and was completed in 2008, though the entire process (including an extensive permitting process) took approximately 7 years.

The project is located in the Kendall area of unincorporated Miami-Dade County. Due to its location in the unincorporated County, the property has its own well and septic system, a fact that would lead to serious complications and delays in the permitting and construction process. The home is also located at the intersection of two dead ends, and it took Mr. Harum-Alvarez several years to get permission from the zoning department to allow his home to front on a pedestrian and bike path and not on a street. As a result, there is a pedestrian connection through the two dead-ends; no street was constructed in conjunction with this project.

Many green features were included in both the design and construction of The Green House in Kendall, including a greywater system, composting toilet, rainwater catchment basins, geothermal heating and cooling, and photovoltaic panels. Each presented its own challenge when seeking approval from County departments. The expedited green permit review process was helpful because the plans were moved to the front of line each time they were brought to the County; however, delays and fees during permitting added an additional $80,000 to the project according to Mr. Harum-Alvarez.

Renewable Energy and Water Conservation

One of the major issues during construction was the rainwater catchment basins. Originally, they were not approved, because they had the potential to flood the cellar and cause a body of standing water on the property. After the test holes were dug but before construction began, four major hurricanes passed through the Gulf of Mexico, and Mr. Harum-Alvarez was able to demonstrate that standing water would quickly infiltrate the soil within a day and a half. He was allowed to construct the basins provided he posted a sign in the cellar of his home warning against potential damage in a 100-year flood event.

The Green House in Kendall incorporates geothermal heating and cooling as well as a composting toilet. Despite the fact that the project would not require use of a septic tank, Mr. Harum-Alvarez was required to provide a large septic tank and drain field, which had a correspondingly large zone of influence. The geothermal heating and cooling system requires two wells, both of which were prohibited in the septic zone of influence, which County staff points out is a state requirement. This made siting the geothermal system very difficult and presented an absurd situation: the builder was required to provide a septic tank, which would never be used, making the geothermal system wells a near impossibility. Mr. Harum-Alvarez reported that acquiring permits for these wells was the most difficult and frustrating part of the project, made more difficult by the overlapping jurisdictions of the Department of Health and the Department of Environment and Resource Management.

The Green House in Kendall achieves a very high level of energy efficiency, with power bills as low as $35 per month. Mr. Harum-Alvarez is proud of this accomplishment, but notes that other builders would quickly abandon the energy efficiency strategies he employed if they were subject to the same difficulties and delays he experienced, as discussed above.

The CDR addresses code issues related to greywater and wastewater treatment system costs (EC-B.12 and EC-B.13), but does not mention how these issues are made more complex when a septic system is required or when a composting toilet is used. Clearly there are conflicts when a septic tank is required by the County but rendered unnecessary when innovative technologies such as a composting toilet are employed. When revising the code to allow greywater and to address the issue of charging for wastewater treatment, the County should also include language related to septic systems and composting toilets. County staff notes that waste disposal is a State code requirement, as are septic tanks when there is no sewer.

County Response

The finished floor elevations originally proposed did not comply with FEMA requirements. DERM worked with the applicant to find a solution and approved the plans. Compliance with FEMA requirements is critical as it impacts the County's Community Rating System (CRS). Communities that are part of the CRS are eligible for flood insurance under the National Flood Insurance Program (NFIP). Not having access to the NFIP would make development in the County difficult to impossible given that banks will not lend money for development without the ability to secure flood insurance. Furthermore, based on the County's adherence to FEMA requirements, the County is rated a 5 in the CRS and this results in a 25% savings in insurance premiums.

County staff also states that while not specifically addressed in the building code, both geothermal heating and cooling and the composting toilet were approved through verification via the alternative materials, design and methods provisions of the code. DERM approved the composting system and it was the State Department of Health that required the onsite sewage treatment and disposal system under Chapter 64E-6, Florida Administrative Code. This part of the state code also requires setbacks to the drainfield. The maintenance, modification and updating of the building code is a State controlled function.

Expedited Permit Process

Mr. Harum-Alvarez was thankful for the expedited green permitting process, but felt the County could go even further to create incentives for green building by streamlining the review process through the use of a "concierge" or ombudsman. When a green project is presented, this concierge could then act as

an advocate and get all approvals necessary from the various departments. His point was that under the current system, drawings are reviewed separately by each of the trades. With green buildings, however, the trades are more integrated and the drawings should be reviewed as a whole system, not as separate and unrelated parts. This suggestion is in line with the possible revisions recommended in the CDR under EC-I.7, but takes it a step further to make the expedited permit process much more coordinated and consolidated.

County Response

The Building and Neighborhood Compliance Department has had staff dedicated to tracking and coordinating qualifying expedite projects (projects of regional impact, affordable housing, government projects or green buildings) since 1998.

This service was further enhanced on November 21, 2005 with the position of Developmental Coordinator or "Ombudsman" being established to work closely with all departments involved in the permitting process to help resolve issues, expedite projects, streamlines processes and to reach out to patrons. (Construction for this project began in 2006, and most of the permitting would have been done well before that, and before the Ombudsman position was created.)

This project benefited from the expedited process and the attention of county staff dedicated to manage and expedite these types of projects. The project submitted by this applicant is classified as residential. The time from permit application acceptance to permit issuance was 123 days. The average cycle time for residential projects (permit application to acceptance) at that time was 210 days. Therefore, this applicant saved 87 days by using the expedited process.

It should be noted that the 123 days include 66 days that the plans were with the applicant/design professional to answer plan review comments. Therefore, the processing time with the Miami Dade County was 57 days.

General Suggestions

Mr. Harum-Alvarez made several suggestions for improving the process for implementing green buildings and sustainable features, especially from the perspective of a small developer. Some are relatively simple measures, such as allowing for large porches to be used for naturally cool and ventilated outdoor living spaces, and not including them in the calculation of the home's square footage, which leads to higher property taxes. EC-R.6 of the CDR recommends shade structures on building facades, roofs, and in parking lots, but the County should also consider encouraging shaded porches, and removing them from the calculation of building square footage.

The more complex suggestion Mr. Harum-Alvarez made would have a greater impact, and could be used as a way to spur development in older, economically challenged areas. He suggested that there should be a set of pre-approved plans for small houses that could be built as-of-right without any water, sewer, or other service upgrades, but by incorporating green strategies that make upgrades unnecessary. Mr. Harum-Alvarez explained that the County currently offers a similar type of program for larger developers called the Cookie Cutter Program; however, he points out that a similar project could be developed for the benefit of smaller developers or for independent homeowners who want to incorporate green features. For example, the permit process and cost of new, larger water lines to the building site could be avoided if a greywater system were installed; the existing, smaller lines could potentially be adequate for potable water needs with the greywater fulfilling non-potable and irrigation needs. For existing

buildings, a new electric panel may not be required if other renewable energy systems were incorporated to maintain a lower load. There are many poor neighborhoods in transit adjacent locations that may never be revitalized because the parcels are too small, the water and other service upgrades too expensive, and it would cause too many headaches for larger developers to tackle.

Using something like the Katrina cottages, or a set of complete building plans that are pre-approved as in the Cookie Cutter Program, the County could start to slowly revive poorer neighborhoods without displacing residents because the homes would be affordable. Mr. Harum-Alvarez felt strongly that this could be a way to bring redevelopment to difficult areas that are well-served by transit. He stated that the County already uses a similar system of stock plans for larger developments, and could provide a similar set of plans for design solutions for green developments that would encourage water reuse, more natural wastewater disposal, and renewable energy. This suggestion could help build predictability into the process of building green by reducing approval times and permit delays, common issues reported by all four developers.

This suggestion is related to RE-B.2 in the CDR, which recommends revising the existing code to allow renovations "to take place without bringing entire site into compliance". Mr. Harum-Alvarez's conjecture is that older areas could be revitalized at a lower cost to the developer and the County's resources if they were exempted from making service upgrades if green technologies could be incorporated instead.

Overall, the Green House in Kendall would have certainly benefitted from a pilot program like the "Living Building Challenge", cited in EC-R.16 in the CDR, or the development of a process for implementing new technologies, cited in RE-B.7. Mr. Harum-Alvarez demonstrated he had the desire to implement new technologies to make his home more efficient than a conventional home, and would have been a great partner to the County as they consider how to modify their codes to encourage other builders to do the same.

County Response

Mr. Harum-Alvarez' suggestion of pre-approved plans stored at the Building and Neighborhood Compliance Department has been available since April 2000 and is known as the Cookie Cutter Program. The program was designed to expedite the plan review process for the construction of a model home being built on a repetitive basis. Once the model is initially approved, subsequent reviews are only required which relate to site location. The reviews are limited to DP&Z, DERM, Public Works, Plumbing (site review only) and Structural for the soil statement. This expedite program is routinely used by affordable housing developers that repeat the same model on a routine basis. However, in all cases the plans are designed to meet code requirements and are signed and sealed by a license professional hired and paid by the developer or owner. Plans cannot be utilized by other applicants unless authorized by the professional. A design professional can choose to use this program for model; homes that incorporated green strategies.

PROJECT 4: THE SIQUIERA RESIDENCE (10000 SW 83RD AVENUE)

Sebastian Eilert of SEA provided information about the Siquiera Residence, a single-family remodel and addition in the Olympia Heights of Miami-Dade County. The zoning of the parcel is EU-M, or Estates Modified, a single-family district. Mr. Eilert has owned his architecture firm for five years and incorporates sustainability into all his projects. He works in all sectors except government and health care; recently most of his work has been focused on residential projects.

Energy Efficiency and Healthy Interiors

For the Siquiera Residence, Mr. Eilert incorporated EnergyStar rated windows and doors into the remodeled portion, as well as spray insulation in the ceiling. A new roof was added to the entire project; Mr. Eilert chose a metal roof for its energy saving properties. He mentioned that metal roofs are allowed in Miami-Dade County except in Coral Gables. He stated that Coral Gables is an exclusive community that does not feel metal roofs fit the aesthetic of the area, and therefore does not allow them.

For both the remodel and addition, Mr. Eilert focused on providing a healthy interior by using non-toxic paint, adhesives, recycled drywall, pour-in-place concrete flooring, and kitchen and bath cabinets made from composite materials to avoid using hardwood. All appliances are EnergyStar rated, and water efficient fixtures were also installed. The owner of the home is well-connected to the landscape industry in the Miami area and was able to specify native plants to minimize water for irrigation. Mr. Eilert felt that because the owner of the home was also the builder, waste from the project was kept to a minimum.

Renewable Energy and Water Conservation

Mr. Eilert cited both budgetary constraints and substantial resistance from the County Health Department as part of the reason he did not implement greywater or renewable energy systems. He stated that incentives are not enough to encourage solar systems, for example, because a return on investment is not seen for 15 years. He felt that wind is not a viable option in southern Florida because there is either too little or too much wind, and there are mounting challenges for both wind and solar systems. (Refer to the “Permitting/Review Procedures” section of the CDR for further discussion of this issue.)

Mr. Eilert designed a home in the Village of Pinecrest, also in Miami-Dade County, where he hoped to incorporate a greywater system and a composting toilet. Village departments (plumbing, building, zoning) approved the system, but the County’s Health Department did not. Mr. Eilert appealed to the State for approval, but the timing was such that he could not wait any longer for the permit since grant money was being used to fund the project. The home now uses a standard septic system despite the homeowner’s desires to incorporate water-saving features.

Expedited Permit Process

The expedited green permit process was used for the Siquiera Residence. Mr. Eilert thinks the process is working, but currently there is very little benefit to being on the top of the pile when there is no pile to speak of. As development picks up again, the benefits to the expedited process will once again be of value. He cited his experience with the City of Miami’s expedited process, where he received permits for a 4500sf home in three and a half weeks, including revisions. This process would have normally taken four-to-six months.

General Suggestions

When asked what the County could do to encourage more sustainable development, he admitted that his suggestion was aggressive, but that requiring certain features or a minimum level of efficiency would have a huge impact. If a minimum level is not achieved, then permits are not issued. The County could also heavily incentivize green development if mandates are not an option. As staff points out, local codes cannot increase requirements beyond what is required by State code, so any mandates would have to be first approved at the State level.

Mr. Eilert's passion is the efficient use of water, and in his experience with other projects in the county, he is of the opinion the County's Health Department is creating hurdles to water-saving features from being incorporated into development. Mr. Eilert cites a project using innovative wastewater strategies that was disapproved by the County Health Department. The Miami-Dade County Health Department has a Septic Tank Office that gets involved in project approval when a septic tank is proposed. The County Health Department uses Chapter 64E-6 of the Florida Administrative Code, which regulates onsite sewage treatment and disposal systems. Changes to the Code would need to be addressed at the State level; however, it appears that there is flexibility in the state regulations that would allow the County some degree of latitude in interpretation of the Code.

In the shorter term, Mr. Eilert thinks the County's water/sewer department could do more to educate people, both builders and the general public, about programs it already has in existence. For example, the County was giving away free water efficient showerheads and $100 rebates for toilet replacement. He felt both were great programs, but were not widely known.

County Response

As noted in the previous project, DERM does not object to greywater systems or composting toilets. The last sentence suggests that water saving features could not be incorporated because a "standard" septic system was required. We've approved projects with significant indoor water savings on "standard" septic systems by including high efficiency fixtures and equipment.

Current tate rules require that the septic tank and drainfield be sized based on the flow rate estimated based on number of bedrooms and square feet, whichever results in a larger flow. This does not prevent the use of high efficiency fixtures (HEF) or ultra HEF (UHEF). So while the septic tank/drainfield for a three (3) bedroom house may be sized for 300 gallons per day (gpd), the actual flow using HEF may be closer to 150 gpd. Using grey water reuse or UHEF, the flow may be reduced further. What would happen if a future property owner is not satisfied with the performance of installed UHEF and changes them to HEF and the septic tank/drainfield was designed and approved for the UHEF flow rate? The result would be improperly treated wastewater discharged to the groundwater. Also consider that while HEF/UHEF may significantly reduce the flow rate, the mass rate of pollutants (what we put into the water) may actually not change. This is important because the operation of the septic tank and drainfield are greatly influenced by the mass rate of pollutants. Sizing the septic tank/drainfield on flow rate could result in tank failure and/or drainfield failure within the biomat caused by excessive mass loading.

Further discussion with Mr. Eilert revealed that although he has heard of the pre-plan submission meetings offered by the County, he has not taken advantage of them.

GENERAL OBSERVATIONS

Interviewing the four developers was an important step in understanding the real-life impacts of Miami-Dade County codes. The County is headed in the right direction by offering an expedited permit process for green projects and other incentives, but could do even more to create a climate where the process of approving and permitting sustainable development is just as predictable and attractive as conventional development. What follows are some general observations that were made while reviewing the CDR.

Recycling

Chapter 15 of the Code of Miami-Dade County requires all multifamily residential projects to provide recycling opportunities to its residents for a minimum of five materials. Based on the conversations with the developers in this report, there is no follow-up from the County to verify if recycling is occurring on site. The code does not provide a timeline for implementing the program, nor does it require the recycling plan to be illustrated on site or any other plans submitted for permits. Perhaps the ode could be modified to require plans before building permits can be issued, as is the case with solid waste.

The two larger developers interviewed for this project provide recycling, but this is to be expected considering they are invested in creating green and sustainable communities. Other more conventional developers may not do the same, especially if there is no feedback loop to verify the provision of a recycling program on site.

Composting

GG-I.1 of the CDR points out that the current code does not include incentives for composting, and that bonuses could be offered to restaurants, grocery stores, etc. that compost their food waste. The County should consider adding language to other districts to allow and provide guidance for composting in residential areas, too.

Staff Education

All of the developers agreed that education of staff at all County departments involved in plan review would be extremely beneficial in making green projects more attractive, as described in the Permitting/Review Procedures section of the CDR. Much of the frustration expressed by the developers stemmed from dealing with individual staff members that did not understand current codes, interpreted them in the strictest of terms, or did not support green alternatives as viable options. As codes are modified and green technologies advance, it is important to provide staff members with ongoing education so they can stay abreast of the latest changes. For further discussion of this topic, refer to the "Permitting/Review Procedures" section of the CDR.

County Response

One County staff member believes that these comments are a misrepresentation of the skills of the building code staff who are in fact highly trained and experienced. Additionally, this section contains an unfair, unproven and incorrect generalization that building code personnel are opposed to sustainable building installations. As building code personnel must enforce the building code as it exists, a more substantive understanding of the basic tenets of the building code on the part of the individuals seeking approval of a sustainable/green project would reduce turnaround time of their submitted plans.

This same staff member felt that efficient processing of plans good cooperation and communication between the owner, design professionals, and County plans examiners.

While the County has made a number of improvements to plans processing (including the applicant's choice of paper or electronic plans processing, many annual "processing" workshops by departments, and process steps streamlining to mention just a few), more can be done by applicants and the County to expedite approval. We continually review process to see how we can improve – across the development departments and to include with outside reviewing agencies. As an FYI, because of a number of positive changes, on average plans are processed faster today than in recent years.

Several of the referenced projects were significantly sized development projects entailing both development approvals and subsequent building permitting issues over a couple of years. They are complicated projects and it is critical to ensure both the development and building plans meet code, utility requirements, etc.

One County service (plans pre-submittal meetings) was not used in several of the provided cases. The County encourages and each year holds many project "plans pre-submittal" meetings. They are of significant benefit resulting in fewer days needed for plans processing for a variety of reasons.

Although many of our customers know to ask for pre-submittal meetings, we may need to find ways to further get the word out.

Finally, with regard to electronic plans processing (a significant time-saver), each year we are processing more and more plans electronically than paper-based. Doing so has been and continues to be a challenge for both our customers and for County management and plans examiners. It is still, today, a change for both design professionals and County plans examiners. We continue to work with both the design professionals and our plans examiners to get them to embrace electronic processing.

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Staff Priority Recommendations

OVERVIEW

Following completion of the Diagnosis, County staff reviewed the numerous recommendations for development and building code amendments made by the consultants. The goal was to winnow the suggestions in the Diagnosis into a list of priority amendments. This list is intended to inform and guide the County's project implementation efforts.

The County staff ranked each recommendation on a scale of one to five, five being the highest priority. Criteria for a higher score included:

- Whether there was an immediate need for the code change;
- The amendment represents a quick success opportunity that should be pursued; and
- The amendment will result in energy savings/efficiency or greenhouse gas emission reduction.

The rating scores are as follows:

5: Proceed—appears to be ready to be drafted into code change;

4: Even though appears to be ready, not the highest priority;

3: Consider after more research—it may be a good idea, but more information may be useful before putting in time to create a text amendment;

2: It needs additional work/changes before can be implemented;

1: Postpone—it may be an area that is complicated or a low priority for this project right now.

The priority recommendations are listed into three sections corresponding to the three major section of the Diagnosis: Energy Efficiency, Greenhouse Gas Reductions, and Renewable Energy. Within each section, the priorities are three categories: Remove Barriers, Create Incentives, and Filling Regulatory Gaps. This summary lists only the highest priorities identified by County Staff. The full rating of all recommendations is available from the county upon request.

ENERGY EFFICIENCY AND CONSERVATION

ENERGY EFFICIENCY AND CONSERVATION (EC)			
EXISTING PROVISIONS	**RECOMMENDED REVISIONS**	**AVG. SCORE**	**COUNTY STAFF COMMENTS**
REMOVE BARRIERS			
EC-B.1: Most zoning code development standards (parking, landscaping, open space), except for Urban Center Districts, are suburban-oriented—discourage infill and redevelopment. Fire and Public Works Departments reportedly do not accept narrower streets as specified in Urban Center Districts and county Urban Design Manual.	Tailor development standards for infill and redevelopment throughout county, not just urban centers (e.g., alternatives to setting aside significant % of sites for open space—allow provision of urban amenities like improved plazas). Planning and Zoning staff have proposed a new Mixed-Use Corridor District that will promote integrated mixed-use development along designated major road-ways. This district contains customized parking and other development standards to that end.	5	
	Work with Fire and Public Works Departments to ensure that they accept street standards tailored for infill and redevelopment areas.	5	
EC-B.3: Except for Urban Center Districts, off-street parking requirements excessive for many uses.	Reduce base off-street parking requirements across the board for infill and redevelopment. Increase automatic reduction for mixed-use projects. Allow on-street parking adjacent to property to count towards minimum on-street requirements. Adopt maximum parking limits to promote more compact, dense urban development.	4	
EC-B.4: Strict nonconforming use/structure requirements discourage "green" building expansion.	Allow renovations/expansions related to "green building" systems and improvements (e.g., adding solar panels, insulation, etc.) to take place without bringing entire use, structure, or site into full compliance. Allow expansions that reduce the degree of nonconformity or do not increase it to proceed without full compliance.	4	Building and Neighborhood Compliance Department (BNC)- Solar panels and other energy enhancements which do not expand the degree of nonconformity should not amount to an illegal expansion or extension that would result in the loss of nonconforming status.
EC-B.6: Not clear that zoning code allows rain barrels and water cisterns as permitted accessory uses and to occupy side yards. Not mentioned in definitions or accessory use/district use lists.	Clarify that rain barrels and cisterns as permitted accessory uses in all zone districts. Allow to be located within or be placed underground in side yards as minor encroachments.	4	

ENERGY EFFICIENCY AND CONSERVATION (EC)			
EXISTING PROVISIONS	**RECOMMENDED REVISIONS**	**AVG. SCORE**	**COUNTY STAFF COMMENTS**
Building Code			
EC-B.8: The State-required energy compliance software is pass/fail though it depends on meeting many different elements and requirements. The system lacks a method to ensure that all the design information, details, and specifications on which the determination of compliance was based are available to the inspector onsite – to verify that what is built fully conforms to what was approved.	Adopt policy changes that require the full details on which the energy modeling is based to be included in the plans and specifications required to be onsite during inspections. The county could further encourage the state to adopt the same to allow for uniformity and predictability for all municipalities in the county.	5	
EC-B.10: Miami-Dade County Approved Rainwater Harvesting Guidelines restrict harvested rainwater use to outdoor irrigation and other outdoor non-potable purposes.	Develop policies to use of non-potable rainwater for indoor uses such as toilet flushing and clothes washing. Based on such policies, adopt rainwater harvesting ordinance based on the existing guidelines as well as inclusion of guidelines for indoor uses. Although concerns have been raised about the cost and additional energy required to treat rainwater added to the sewerage flow, that energy use is offset by the reduced energy use for the treatment and supply of the potable water that would have been used instead. In addition there are water demand and stormwater reduction benefits resulting from increased onsite use of rainwater.	4	
EC-B.11: The Florida State Plumbing Code was updated in 2009 to allow grey water to be used for flushing of toilets and urinals. *Florida Plumbing Code Appendix C, Gray Water Recycling Systems.*	Consider adopting provisions of the Florida Plumbing Code to allow use of grey water for flushing of toilets and urinals.	4	BNC - Current efficiency of plumbing fixtures brings into question cost/benefit issues. Health safety is also a concern with grey water use.

ENERGY EFFICIENCY AND CONSERVATION (EC)			
EXISTING PROVISIONS	**RECOMMENDED REVISIONS**	**AVG. SCORE**	**COUNTY STAFF COMMENTS**
CREATE INCENTIVES			
EC-I.2: Zoning code parking regulations do not address parking or services for alternative fuel vehicles, carpool vehicles, and shuttles.	Allow for creation of priority parking spaces for alternative fuel vehicles, carpool vehicles, and shuttles.	4	
EC-I.3: Zoning code does not address electric vehicle charging stations as a use in zone districts.	Specifically allow electric vehicle charging stations as accessory use in all zone districts.	5	
EC-I.4: Various zoning code and landscape ordinance provisions require the protection of large trees and preservation/planting of native vegetation. However, no additional landscaping credit for preserving trees in infill situations where it is most challenging to do so.	Provide bonus credit towards landscaping requirements for preservation of large existing trees for infill development.	4	
Building Code			
EC-I.6: Expedited permitting program for green buildings. (Ch. 8-6)	Consider amending expedited permitting program ordinance to apply to all county departments involved in the permitting and approvals process for green buildings, for both new and existing buildings. Consider amending expedited permitting program to apply to all county departments. Explore using the International Green Construction Code as the standard for buildings to qualify for expedited permitting. Explore using the International Green Construction Code as the standard for buildings to qualify for expedited permitting.	4	BNC - All departments in Unincorporated Miami-Dade County expedite green permit reviews, with the exception of permit reviews that are outside the purview of Chapter 8 Code of Miami-Dade County.

ENERGY EFFICIENCY AND CONSERVATION (EC)			
EXISTING PROVISIONS	**RECOMMENDED REVISIONS**	**AVG. SCORE**	**COUNTY STAFF COMMENTS**
FILLING REGULATORY GAPS			
EC-R.1: Zone districts specify maximum densities, but not minimum density or minimum mix of uses. County does address mini-mum densities in mixed-use areas by limiting low-density housing types	Consider requiring minimum densities, especially in potential transit-oriented development and mixed-use areas. As proposed in 2010 EAR, require minimum mix of commercial/office uses in residential to provide employment and minimum mix of residential units in commercial areas to provide housing close to jobs.	4	
EC-R.2: Urban Center Districts address sidewalk, connectivity requirements, but most zone districts and subdivision regulations do not.	Create mandatory internal and external connectivity standards for all developments.	4	
EC-R.3: Zoning ordinance outdoor lighting regulations are minimal as are those found in Chapter 8C (Building Security Measures) of the County Code. Neither address modern energy-saving approaches or technologies like solid-state and LED lighting.	Consider adopting comprehensive outdoor lighting code that addresses maximum illumination, lighting budgets, lighting curfews, etc.	4	BNC - Maintain minimum levels of safety
EC-R.5: Zoning code and landscape ordinance contain no provisions relating to cool roofs, green roofs.	Consider requiring cool roofs and/or green roofs. Provide for exceptions where such roofs are technically not appropriate or feasible.	4	BNC - Cool/reflective roofs as mandatory is the most promising.
EC-R.6: Zoning code does not address shade structures.	Consider making shade structures mandatory on building facades, roofs, and in parking lots and minimum solar reflectance for roofs and pavement.	4	
EC-R.8: Zoning code provisions related to bicycle parking are basic at best.	Require more bicycle parking plus other facilities (showers, lockers, etc.). Tailor to specific uses instead of tying to vehicle parking space requirements.	4	
EC-R.9: Zoning code does not address electric vehicle charging stations.	Consider requiring certain percentage/number of parking spaces to have electric vehicle charging stations or be prewired to provide in future.	5	

ENERGY EFFICIENCY AND CONSERVATION (EC)			
EXISTING PROVISIONS	**RECOMMENDED REVISIONS**	**AVG. SCORE**	**COUNTY STAFF COMMENTS**
EC-R.10: Zoning code and subdivision regulations do not address solar access protection.	Consider adding more formal process for protecting solar access.	4	
EC-R.11: Zoning code and subdivision regulations do not address homeowner covenants that restrict small-scale solar installations.	Consider adding provisions that ban homeowner covenants that ban solar systems allowed by county building and zoning regulations.	4	
EC-R.13: Landscape ordinance contains many progressive provisions, but can be taken to next level to realize even more substantial water conservation.	Make targeted revisions to landscape ordinance:		
	Require water budgets for all MR and non-residential projects that require reductions in water use a specified % below average current use.	4	
	Require irrigation systems to be on separate meters for monitoring purposes.	4	
	Require all plant materials, not just trees/shrubs, to have minimum % of drought-tolerant species. Staff reportedly re-quires this informally, but not in code.	4	
	Establish efficiency standards of irrigation systems.	4	
EC-R.14: Tree protection regulations are geared primarily to large developments with extensive canopies. Some protection for specimen trees.	Add tailored tree protection standards for infill and redevelopment sites. Require 1:1 caliper mitigation if specimen trees can't be saved. Allow some off-site mitigation. Do not apply canopy retention standards to infill sites.	4	
Building Code			
EC-R.16: State law precludes local governments from enacting energy codes that are more or less stringent than the State Building Energy Code.	Consider adopting the International Green Construction Code (IGCC) as a voluntary "stretch" code to facilitate the construction of "beyond code" projects while also working for statewide adoption of this code. Compliance with IGCC would qualify for expedited green building permit program and future tenant improvements. For link, see footnote.	4	

GREENHOUSE GAS REDUCTIONS

GREENHOUSE GAS REDUCTIONS (GG)			
EXISTING PROVISIONS	**RECOMMENDED REVISIONS**	**AVG. SCORE**	**COUNTY STAFF COMMENTS**
REMOVE BARRIERS			
Recycling			
GG-B.1: Current zoning code does not address community-serving recycling or composting stations for neighborhoods or in residential subdivisions or large commercial projects.	Allow recycling and composting stations as a permitted or special exception use in most zone districts, subject to locational and compatibility standards.	4	
Development Patterns—Mixed-Use, Infill, and Compact Growth			
GG-B.4: Generally applicable off-street parking requirements excessive for many uses. Geared for suburban uses.	Reduce base off-street parking requirements. Increase automatic reduction for mixed-use projects near existing/planned transit stops (now 10%). Allow on-street parking adjacent to property to count towards minimum on-street requirements. Adopt maximum parking limits.	4	
GG-B.5: Strict nonconforming use/structure requirements discourage "green" building renovation/expansion.	Allow renovations/expansions related to "green building" (e.g., adding solar panels, insulation, etc.) to take place without bringing entire site into compliance or allow expansions that reduce the degree of nonconformity or do not increase it to proceed without full compliance.	5	Solar panels and other energy enhancements which do not expand the degree of nonconformity should not amount to an illegal expansion or extension that would result in the loss of nonconforming status.
CREATE INCENTIVES			
Development Patterns—Mixed-Use, Infill, and Compact Growth			
GG-I.2: Existing mixed-use zone districts create some incentives for mixed-use projects.	Offer development bonuses (height, density, etc.) for implementing sustainability goals. Tailor development standards to encourage infill and redevelopment.	4	
GG-I.3: Zoning code does not mention or address vegetated/ green roofs.	Allow vegetated/green roofs to count toward landscaping and open space requirements or provide bonus (height, density, etc.)	4	

GREENHOUSE GAS REDUCTIONS (GG)			
EXISTING PROVISIONS	**RECOMMENDED REVISIONS**	**AVG. SCORE**	**COUNTY STAFF COMMENTS**
Tree and Vegetation Preservation and Planting			
GG-I.4: Zoning Code and Landscape Ordinance provisions protect native vegetation but do not give landscape credit for preserving trees.	Provide bonus credit towards landscaping requirements for preservation of large existing trees, including non-native species.	4	
FILLING REGULATORY GAPS			
Development Patterns—Mixed-Use, Infill, and Compact Growth			
GG-R.3: LUC specifies maximum densities, but not minimum density or minimum mix of uses.	Consider requiring minimum densities, especially in potential transit-oriented development and mixed-use areas.	4	
GG-R.4: Several urban center districts address sidewalk, connectivity requirements.	Create mandatory internal and external connectivity standards for all major developments.	5	

RENEWABLE ENERGY

RENEWABLE ENERGY (RE)			
EXISTING PROVISIONS	**RECOMMENDED REVISIONS**	**AVG. SCORE**	**COUNTY STAFF COMMENTS**
REMOVE BARRIERS			
RE-B.2: Strict nonconforming use/structure requirements discourage "green" building renovation/expansion.	Allow renovations/expansions related to "green building" (e.g., adding solar panels, insulation, etc.) to take place without bringing entire site into compliance or allow expansions that reduce the degree of nonconformity or do not increase it to proceed without full compliance.	5	Solar panels and other energy enhancements which do not expand the degree of nonconformity should not amount to an illegal expansion or extension that would result in the loss of nonconforming status.
Building Code			
RE-B.5: According to stakeholders, the permitting process for solar PV installations lacks predictability in cost and time required, and whether structural engineering will be required. Additional issue with potential for solar installations to void roof warranties.	Review the solar PV and solar thermal permitting and inspection processes to further streamline permitting through a process involving solar vendors and installers. Consider creating a standard package of requirements, guidelines, with tiers clearly delineated and inspection checklist. . Routing through the permit review process should only go to those departments directly affected. Follow-up inspection after installation is complete and in operation is recommended as well. Hands-on educational course for staff, system designers and contractors is recommended. Additionally, the County could lead an effort to standardize solar permitting in all municipalities.	5	This recommendation was implemented in May 2009. At that time the Board of Rules and Appeals established the "Renewable Energy Uniform Permit Submittal Guidelines and Instructions and Recommendations". This requires all building departments in Miami-Dade County to establish an individual master permit for solar installations, sets forth mandatory inspections and provides guidance to Designers and Contractors. Requirements for involvement of a structural engineer are clearly delineated and notification regarding warranties is a non-mandatory recommendation. Costs related to permits are based on actual costs to operate the building department. As a consequence, uniform fees are beyond the purview of BORA or the building code. All inspectors, plans examiners and building officials receive annual specialized and ongoing general formal training.

RENEWABLE ENERGY (RE)			
EXISTING PROVISIONS	**RECOMMENDED REVISIONS**	**AVG. SCORE**	**COUNTY STAFF COMMENTS**
RE-B.8: High-velocity wind area requirements pose a continuing challenge to renewable energy installations on buildings (solar electric and solar thermal systems as well as wind turbines).	The state and county requirements related to high winds add an additional layer of complexity to permitting for building-mounted or integrated renewable energy systems. Convene a process to bring stakeholders together to assess and address issues related to high wind and installation and maintenance of renewable energy systems.	4	The most fundamental goal of the building code is the principle that health, safety and welfare of the community is the highest law. The requirement that all buildings, structures and parts thereof must comply with the minimum wind and other loads is firmly rooted in that principle.
FILLING REGULATORY GAPS			
RE-R.2: The zoning and subdivision codes do not contain any provisions addressing solar access.	Consider adding provisions addressing solar access and a formal process for protecting solar access.	4	