



GREEN BUILDING CITY MARKET BRIEFS



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ACKNOWLEDGEMENTS

FOREWORD

This report addresses a critical issue facing mayors in cities around the world: building energy use is a leading contributor to urban – and global -- greenhouse gas (GHG) emissions. It therefore represents one of the greatest opportunities for cities to tackle climate change locally, and contribute to ambitious national government targets at the Paris COP21 and beyond.

Cities are the drivers of development, growth and investment. But rising consumption and production in cities is causing more than 70 percent of global greenhouse gas emissions, and cities are vulnerable to climate impacts, such as sea level rise, heat waves and drought. If cities continue to develop according to the prevailing 20th century model, it will not be possible to prevent severe climate change.

Fortunately, today, a number of leading mayors are forging a path to low carbon development and are already achieving economic growth by investing in sustainable city climate solutions. Indeed city leaders have been among the first to take climate action, proving that cities are a key part of the solution to climate change. Climate Action in Megacities 2.0, C40 Cities Climate Leadership Group's (C40) flagship report, reveals that 20% of all C40 city climate action is aimed at reducing emissions related to buildings, through measures such as green building codes, or policies targeting schools and municipal buildings. And there is scope to do so much more. In fact, C40's research estimates that cities could reduce urban building emissions globally by 2.4 GtCO₂e in 2030 and 4.4 GtCO₂e in 2050 .

The longstanding partnership between the C40 and the World/US Green Building Councils has focused on helping cities seize these very opportunities to realize efficiencies in building energy and water resource use, delivering results in carbon reductions. The pages to follow show us that C40 cities, representing 500+ million people and one quarter of the global economy, are taking bold and innovative steps to address building energy use, improving the long-term sustainability of their municipal and private building infrastructure, for the benefit of urban citizens.

We are proud to showcase such a vast compendium of solutions and key trends that can be shared and implemented more broadly by cities around the world. The kind of knowledge sharing and cooperation among cities that this report engenders is at the heart of the solution to climate change. Through local action, we are truly making a global impact.



ROGER PLATT
PRESIDENT,
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MARK WATTS
EXECUTIVE DIRECTOR,
C40 CITIES CLIMATE
LEADERSHIP GROUP

EXECUTIVE SUMMARY

The U.S. Green Building Council (USGBC), the World Green Building Council (WGBC) and C40 Cities Climate Leadership Group (C40) teamed up to create this compendium of city market briefs to shine a light on the exceptional work being done in the buildings sector by C40 cities around the world. By cataloguing the leading policies, programs and projects in cities, we hope to provide a comprehensive and accessible reference document that will inspire all cities seeking to increase building energy efficiency. USGBC gathered the information for the city building briefs from publicly available sources as well as C40 mayoral powers data.

The research spans a broad range of action areas, including city-wide sustainability initiatives, private sector green building incentives, green codes, sustainable community development, energy benchmarking, green schools, green affordable housing, and sustainable transportation measures. All of these important actions are intended to mitigate climate change by reducing emissions, and create a more livable city. Further, these cities have certified nearly 5,000 LEED (Leadership in Energy and Environmental Design) projects— a powerful demonstration of the collective impact of the leading green building policies and actions these cities have taken. Given the many ways for cities to take action in reducing emissions from the built environment, there are a few key ways with which cities are doing this that are worth highlighting here.

- **74%** are implementing incentives for a greener built environment,
- **67%** have made a commitment to green building codes,
- **73%** have green schools policies in place,
- **61%** enacted municipal green building policies, and
- **49%** are implementing sustainable community policies.

WALK THE TALK

SIXTY-ONE PERCENT of C40 cities have enacted **municipal green building policies**. These are critical as cities have the most control over their own buildings and are able to lead by example. For example, San Francisco requires its municipal facilities to achieve LEED Gold certification. The city of Basel has committed to a goal of becoming a carbon-neutral administration by 2040. Melbourne also has a goal of achieving zero-net emissions by 2020 for city operations. The city met its interim target of a 50% reduction below 1996-1997 emission levels in 2010. London's RE:FIT program targets public building retrofits as a way to cut emissions and decrease energy costs. Beijing requires all new buildings, both public and private, to achieve a one-star rating under the China Green Building Label.

PROVIDE A GREEN FOUNDATION

SIXTY-SEVEN PERCENT of C40 cities have made a commitment to **green building codes** by instituting green building and energy codes in an effort to reduce emissions attributable to private sector buildings. Singapore's Building Control Act requires all new construction and retrofits of existing buildings to achieve, at minimum, a Certified rating under the Green Mark Scheme; a proprietary rating system developed by the Building and Construction Authority of Singapore. The city of Boston requires all large-scale developments to achieve certification under the appropriate LEED rating system. Stockholm requires new buildings on land designated by the city to have a maximum energy intensity no greater than 55 kWh/m²; 35 kWh/m² lower than the national standard.

INCENTIVIZE THE MARKET

NEARLY THREE-QUARTERS of the C40 Cities are implementing **incentives for a greener built environment**. To further spur sustainable development, many C40 cities have instituted incentives that reward private sector uptake of green building measures. Amsterdam provides property owners installing green roofs with a €50 per square foot subsidy, meant to cover 50% of the total installation costs. Several other cities such as Mexico City and New York City also incentivize the installation of green roofs. Shanghai offers developers a wide range of incentives for incorporating various sustainable features in projects, such as the incorporation of renewable energy and upgrades to a building's shell. Seattle offers developers and property owners seeking LEED certification expedited review and permitting to streamline green projects. Nairobi provides property owners that are interested in increasing the energy efficiency of their property with subsidized energy audits.

Increasingly, more cities are targeting the residential sector as a way to reduce energy intensity and carbon emissions. Austin's inventive S.M.A.R.T. Housing™ program provides fee reductions to developers of low-income housing that meet program specifications such as green building requirements and access to public transportation. Athens established the Energy Efficiency in Household Buildings Program, which provides residents with free energy audits and access to low-interest financing to perform energy efficiency improvements. The Jakarta Green Building Code requires energy intensity reductions in residential structures that can be achieved by simple, cost-effective measures. There is also a growing movement in developing programs targeting entire communities with **49%** of C40 Cities currently implementing sustainable community policies.

TEACH OUR CHILDREN

SEVENTY-THREE PERCENT of C40 cities have **green schools policies** in place that are simultaneously reducing greenhouse gas emissions and educating our future generations. C40 cities are engaging their youth in emissions reduction measures in innovative ways such as Lagos' Power Kids Program, an interactive, extra-curricular initiative that teaches students about energy and how their behavior impacts the environment. In Curitiba, students learn proper recycling techniques and are in turn rewarded with toys, bus passes, or movie tickets for their recycled goods. Under the Paris Climate and Energy Action Plan, 30% energy savings are expected in primary and pre-schools; secondary school students are to take part in a program on energy efficiency that features building tours, conferences, and debates.

BUILD RESILIENCE

Actions to improve building energy efficiency collectively **build city climate resilience**. In addition, C40's member cities are implementing targeted strategies to minimize the impacts of climate change, such as heat waves, cloudbursts or drought. Berlin has instituted a storm water fee system designed to tax property owners based on the amount of impervious service on their respective land. Johannesburg issued a green city bond to develop the necessary capital to implement adaptation strategies. The city of Toronto provided funds for the development of an innovative cooling system that draws water from the cold depths of Lake Ontario to provide cooling to city buildings.

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GREEN BUILDING CITY MARKET BRIEF

AUSTIN

TEXAS



A CITY-WIDE MOVEMENT

Austin Energy Green Building (AEGB) was established in 1990 by the City of Austin, and was the first municipally operated green building program in the world. AEGB created the country's first green building rating system for homes in 1991. The program received the Local Government Honor Award in 1992 at the UN Earth Summit in Rio de Janeiro, and the Habitat Scroll of Honour Award from the UN Human Settlements Programme in 2011.

LEADING BY EXAMPLE

In 2007, Austin City Council passed Resolution No. 20070215-023, formally adopting a goal of making city operations carbon-neutral by 2020.¹ As of 2012, all electricity used to power city-owned facilities comes from renewable sources through Austin Energy's GreenChoice® program.

Since 2000, all public building projects, with a construction budget of USD \$2 million or more, have been required to achieve LEED Silver certification. In addition, smaller renovations, and interior finish-outs, with a construction budget of USD \$300,000 or more, that are eligible for LEED certification must also achieve a minimum of LEED Silver.²

SUSTAINABLE COMMUNITIES

The Imagine Austin Plan, adopted by the Austin City Council in June 2012, is a thirty-year plan that is aimed to direct growth in a sustainable, compact, and connected manner. Informed by broad community input, Imagine Austin provides a vision and roadmap for the city's future. This vision includes ensuring the city will be safe and affordable; promote physical activity, community engagement, and inclusion; make amenities and services easily accessible to everybody; and contribute to Austin's unique community spirit for current and future residents.³

CITY EMISSIONS TARGET:

On April 10, 2014, the Austin City Council passed Resolution 20140410-024, establishing a long-term goal of reaching net-zero community-wide greenhouse gas emissions by 2050, or earlier, if feasible.⁴

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✓
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	850,000
Land Area (km ²)	725
Gross Domestic Product (in USD billions)	86
Average Walk Score ⁵	35/100
Annual Rainfall (mm/year)	817
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁶	19,430,000
% of Emissions from the Building Sector	55%
Municipal Emissions (metric tons CO ₂ e)	80,000

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Austin) ⁷	2,701
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PROJECT BREAKDOWN

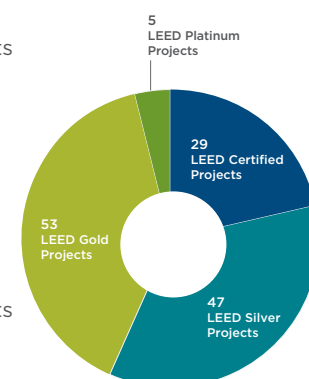


144
LEED Certified Projects
(Austin)

249
LEED Registered
Projects (Austin)

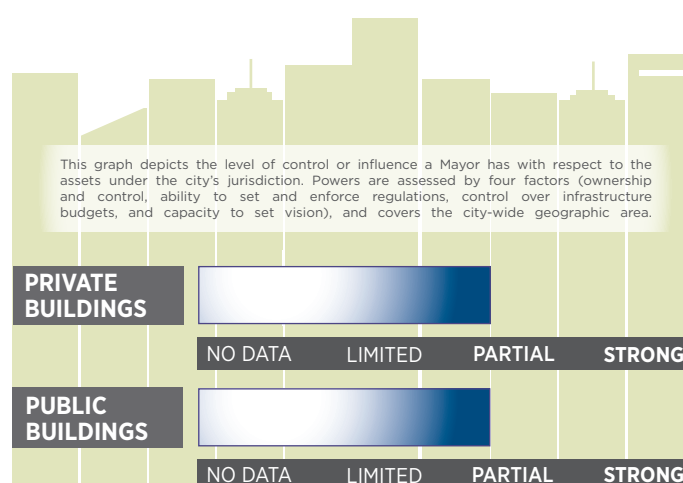
1,383
LEED Certified Projects
(Texas)

2,257
LEED Registered
Projects (Texas)



Graph depicts the distribution of LEED certified projects in Austin

MAYORAL POWERS



GREEN AFFORDABLE HOUSING

The city of Austin has numerous green building provisions within building codes, with requirements that vary according to location, zoning designation, and building type. The building standards rely on the AEGB rating system and the LEED certification system as metrics. In some cases developers have the option of achieving compliance under either of the two systems. Under the AEGB rating system, buildings are awarded up to five stars depending on the number and breadth of green building elements that are incorporated into the design. In terms of energy efficiency, rated buildings are designed to exceed the Austin Energy Code, which itself is one of the most aggressive in the nation. In 2007, the City Council passed Resolution No. 20070215-23, the Austin Climate Protection Plan, calling for progressively stricter building codes that reduce energy use in single-family homes by 65% and all other public and private buildings by 75% by 2015.⁸

PRIVATE SECTOR INCENTIVES

Rebate and loan programs that incentivize sustainability, resource efficiency, and green technologies are offered by Austin's municipal utilities and city departments. Austin Energy offers residential and commercial rebate programs ranging from residential HVAC upgrades to commercial thermal energy storage. Austin Energy's solar programs contribute to Climate Protection Plan's 200 MW solar goals through rebates and the Performance Based Incentive (PBI) program. Austin Water and its Water Conservation program incentivize building and irrigation water conservation and greywater reuse through rebates and education programs. Other incentives and resources are available to the private sector from Austin Resource Recovery, Watershed Protection, and Austin Energy's Electric Vehicles and Demand Response programs.⁹

GREEN AFFORDABLE HOUSING

In 2000, the city of Austin adopted the S.M.A.R.T. (Safe, Mixed-income, Accessible, Reasonably-priced, and Transit-oriented) Housing Policy Initiative, which is intended to encourage smart growth and stimulate the development of affordable renter, and owner occupied housing.⁹ S.M.A.R.T. Housing™ is also required to meet green building standards for all new construction.¹⁰

GREEN SCHOOLS

The Austin Independent School District (ISD) is responsible for implementing green initiatives in schools across the city. Austin ISD initiatives include energy and resource conservation, resource recovery, sustainable school grounds, water management, sustainable transportation, and campus green teams. Composting is available in 90% of school cafeterias in Austin.¹¹ Since 2004, all new school buildings and additions have voluntarily achieved a two-star AEGB rating at a minimum.

PROJECT SPOTLIGHT:

Dell Children's Medical Center of Central Texas

Dell Children's Medical Center became the first hospital in the world to earn Platinum certification under the LEED for New Construction rating system in January 2009. The hospital has also achieved LEED Gold certification for its Neurosurgical Addition and the world's first Platinum certification under LEED for Healthcare for the McCarty South Tower Addition. Efficient mechanical, lighting, and envelope systems, augmented by connection to a highly efficient district combined heat and power plant, resulted in modeled energy savings that exceed 60%. Municipally-supplied reclaimed water is used for irrigation at the hospital campus. Water efficient fixtures help reduce indoor water use by 33% in the main hospital and 39% in the South Tower Addition. Building materials, furniture, cleaning products, and pest management procedures are selected based on rigorous health and sustainability standards to eliminate VOCs, toxins, and other harmful compounds from the healing environment and protect natural resources.¹²



Photo courtesy of McConnell Photography

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GREEN BUILDING CITY MARKET BRIEF

BOSTON

MASSACHUSETTS



A CITY-WIDE MOVEMENT

Greenovate Boston is a city-wide community-driven movement to get residents of Boston involved in reducing the city's greenhouse gas emissions according to the city's Climate Action Plan. The plan's website contains tips for individuals to lower their emissions footprint in categories such as energy, transportation, waste, and water. The site serves as a forum featuring members of the Boston community living green at home and at work, and also features news on environmental matters in the city.¹

LEADING BY EXAMPLE

The city of Boston currently requires that all newly constructed and majorly renovated municipal buildings be constructed to LEED Silver standards.

In an effort to illustrate their commitment to green building, the city of Boston constructed a green roof on city hall. The project will serve as a living laboratory for students from Tufts University to determine what types of plants flourish on Boston's roofs.²

GREEN CODES

Under Article 37, inserted January of 2007, Boston became the first city in the United States to require all large-scale projects to meet LEED certification standards set forth by the U.S. Green Building Council. Additionally, the Article contained separate Boston Green Building Credits (BGBCs), to be awarded to a project upon completion. BGBCs include modern grid measures, historic preservation, groundwater recharge, and modern mobility. The modern mobility category is designed to encourage sustainable forms of transportation and includes additional credits that projects must meet for hotel, office, retail, educational, medical, residential, and basic buildings.³

BENCHMARKING

The Building Energy Reporting and Disclosure Ordinance (BERDO) was enacted by the city of Boston in 2013. BERDO requires large and mid-size non-residential buildings to report their energy and water use information to the city. The ordinance mandates buildings undergo an energy audit every five years. Exemptions are provided for buildings already proven to be efficient, as well as buildings that have made significant progress.⁴

CITY EMISSIONS TARGET:

The city of Boston plans to reduce CO2 emissions by 20% by 2020, compared to 2005 levels. The city has a more ambitious goal of reducing emissions by 80% for 2050, compared to 1990 levels.⁵

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✓
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	636,000
Land Area (km ²)	125
Gross Domestic Product (in USD billions)	320
Average Walk Score ⁵	80/100
Annual Rainfall (mm/year)	1,112
Climate Action Plan	Yes

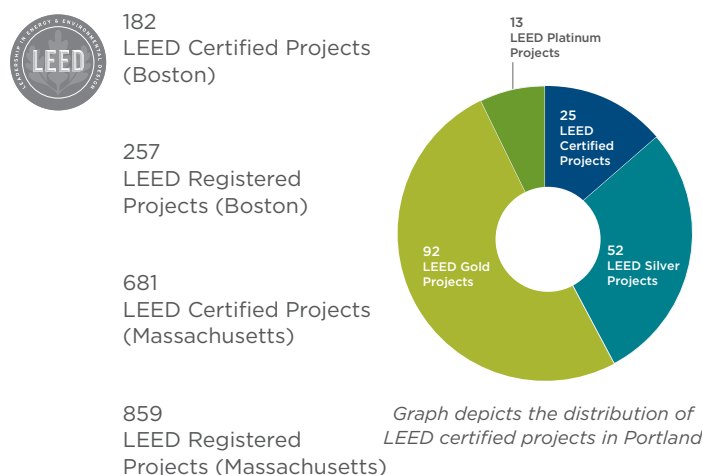
BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁶	6,800,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

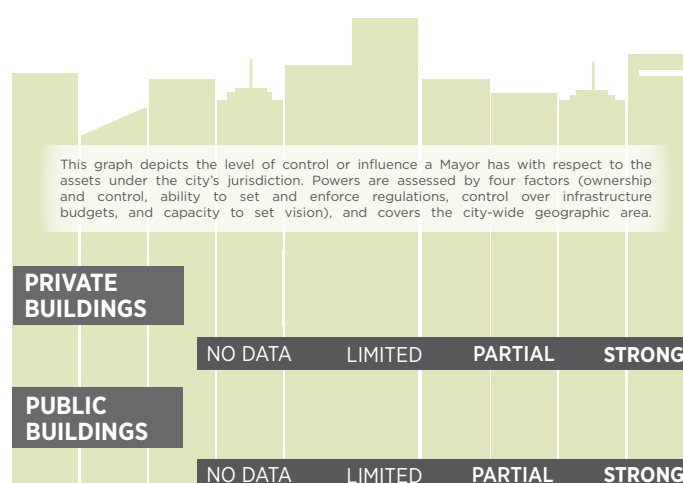
MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Boston) ⁷	796
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PROJECT BREAKDOWN



MAYORAL POWERS



POLICY SPOTLIGHT:

Boston's Climate Action Plan, put in place in April of 2007, serves as a blueprint to meet the city's emissions reductions goals. Under the initial Executive Order, the plan is to be updated every three years to allow for the adoption of new technologies and standards.⁸

PRIVATE SECTOR INCENTIVES

Boston's "Whole Building Incentive" applies to multi-family developments, providing eligible owners, landlords, and tenants with enhanced energy efficiency incentives. Eligible buildings qualify to receive a no-cost energy assessment for each unit, no-cost instant savings through high-efficiency light bulbs, no-cost air sealing, 90% cost coverage up to \$3,000 per unit for insulation installation, generous rebates for qualified ENERGY STAR® products, a 0% interest HEAT Loan to finance energy efficiency upgrades, and incentives of up to \$300.00 for combustion safety analysis to eliminate high carbon monoxide levels, and \$250.00 for dryer venting replacement/installation/repair.¹⁰

The State of Massachusetts offers incentives for residents who desire to install solar photovoltaic panels. Available incentives can reduce the overall cost of a residential system by 30-50%.

GREEN AFFORDABLE HOUSING

Boston's Department of Neighborhood Development adopted standards requiring new developments, both residential and commercial, meet both LEED Silver, as well as and ENERGY STAR® standards.¹¹

GREEN SCHOOLS

In Boston, home of the nation's first public school, significant efforts are underway to green the city's public school system focusing on whole school sustainability. Programs in place across the district include energy saving initiatives, recycling efforts, health and wellness measures, plans to turn barren asphalt schoolyards into green recreation areas, and much more. Additionally, the city of Boston was selected by the Center for Green Schools to receive a three-year sustainability fellow.¹²

SUSTAINABLE COMMUNITIES

Boston Bikes is an initiative undertaken by the government in an effort to make Boston a world-class cycling city by providing safe conditions for all residents and riders. The city government hosts a website with information on the city's bike lane network, bike map, bike safety guide, bike-share program, bike events, bike parking, alternative transit options, bike friendly business awards, and annual bike summaries for the city.¹³

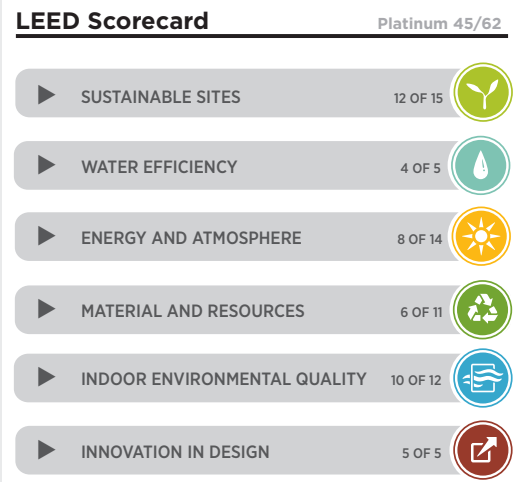
PROJECT SPOTLIGHT:



Photo courtesy of Flickr Creative Commons user KAdam

Atlantic Wharf

Atlantic Wharf was certified Platinum under the LEED Core and Shell 2.0 rating system, making it Boston's first green skyscraper. The mixed-use development was designed to use 40% less than a typical existing office in New England. Half of the wood used in the project was certified by FSC, and over 85% of construction waste was diverted from landfills.¹⁴



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GREEN BUILDING CITY MARKET BRIEF

CHICAGO

ILLINOIS



A CITY-WIDE MOVEMENT

Under the leadership of Mayor Rahm Emanuel, the city of Chicago is among the vanguard of global cities that are leading the way on climate change mitigation and adaptation. *Sustainable Chicago 2015* – a 3-year action agenda to make the city more livable, competitive, and sustainable – builds on Chicago's environmental vision by highlighting 7 themes, 24 goals, and 100 concrete actions that brings Chicago's long-term climate goals into immediate focus.¹ Emphasizing job creation, resource efficiency, and resident engagement, *Sustainable Chicago 2015* offers a blueprint for sustainable development and improved quality of life. In its 2013 urban competitiveness study, *The Economist* recognized Chicago as the top U.S. city for environmental governance and its ability to deal with environmental challenges.²

LEADING BY EXAMPLE

Through its *Sustainable Development Policy*, the city of Chicago requires LEED certification for all new municipal buildings. Furthermore, private projects located in planned development zones or that receive city assistance must achieve LEED certification, exceed ASHRAE standards, and/or incorporate green roof features on at least 25% of available roof area.³

CROSS-SECTOR COLLABORATION

Launched in 2012, Retrofit Chicago is a voluntary, cross-sector effort to drive energy efficiency in municipal, commercial, and residential buildings across the city, saving money, reducing carbon emissions, and creating jobs.⁴ Recent milestones include: 13,000 residential retrofits completed through July, 2014; 37 million square feet of commercial space committed to 20% efficiency improvement within five years; and a comprehensive, self-funding effort to retrofit 60 municipal buildings.

CITY EMISSIONS TARGET:

The *Chicago Climate Action Plan* sets forth ambitious greenhouse gas reduction targets of 25% by 2020 and 80% by 2050, relative to 1990 emissions.⁵

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✓
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	2.72 million
Land Area (km ²)	592
Gross Domestic Product (in USD billions)	524.6
Average Walk Score ⁶	75/100
Annual Rainfall (mm/year)	955
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁷	35,550,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

USGBC Illinois Chapter Membership	1,312
LEED Credentialed Professionals (Chicago) ⁸	6,469

PROJECT BREAKDOWN

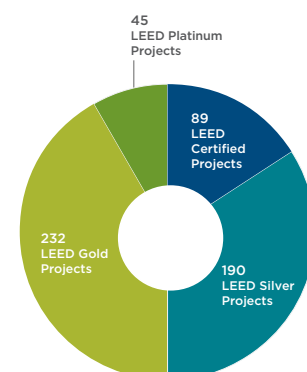


556
LEED Certified Projects
(Chicago)

589
LEED Registered
Projects (Chicago)

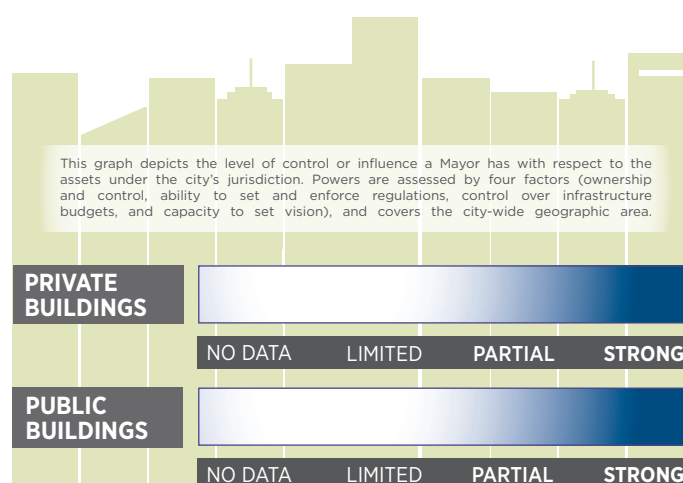
1,041
LEED Certified Projects
(Illinois)

1,151
LEED Registered
Projects (Illinois)



Graph depicts the distribution of LEED certified projects in Chicago

MAYORAL POWERS



POLICY SPOTLIGHT:

In September 2013, Chicago adopted a building energy benchmarking ordinance to raise awareness, increase transparency, and accelerate action on building efficiency.⁹ The policy calls on existing municipal, commercial, and residential buildings larger than 50,000 square feet to track whole-building energy use, report to the city annually using ENERGY STAR® Portfolio Manager, and verify data accuracy every three years. The ordinance also authorizes the city to make building energy performance data available to the public, beginning in the second year of reporting.

PRIVATE SECTOR INCENTIVES

In 2010, Chicago established a Green Permit Program, which rewards projects striving to achieve LEED certification, or comparable rating, with expedited permitting. In addition to expedited permitting, projects striving to achieve higher levels of certification under LEED, or a comparable system, are eligible to receive a permit fee reduction of up to \$25,000. Additionally, a certain number of “menu items” must be completed to receive a fee reduction. Examples of “menu items” prescribed in the program include: green roofs, the incorporation of renewable energy, natural ventilation, exceptional bike parking, and transit-oriented development.¹⁰

TRANSPARENCY IN RESIDENTIAL ENERGY USE

On July 3, 2013, Chicago became the first city in the nation to require home listings on the Multiple Listing Service (MLS) to display both annual and monthly gas and electric costs to help homebuyers make informed purchasing decisions.¹¹

GREEN SCHOOLS

Chicago Public Schools’ Environmental Action Plan consists of 26 results-oriented initiatives aimed at minimizing its environmental impact while teaching students environmental stewardship. The specific initiatives each fall under the following broader categories: energy, waste and recycling, transportation and air, land, water, and education and environment. Through the plan, healthy/local/organic school lunch programs have been instituted, renewable energy purchasing has been maintained at 20%, and student active transportation, such as biking and walking, have been promoted.¹²

SUSTAINABLE COMMUNITIES

Bike 2015 is the city’s plan to make bicycling a more integral part of daily life in the Chicago. An example of the program’s measurable goals include reducing the number of bicycle injuries by 50%. The plan is divided into eight chapters, each with a specific goal. Chapters include: bike parking, bicycle-friendly streets, education, law enforcement, and crash analysis.¹³

PROJECT SPOTLIGHT:



Photo courtesy of Flickr Creative Commons user Chicago Public Building Commission

Engine Company No. 16

Chicago’s Engine Company No. 16 achieved Platinum certification under the LEED for New Construction rating system in April 2013. The building’s design resulted in a 63% reduction in potable landscape water use and an over 33% reduction in indoor water use, both against a modeled baseline. The building is projected to experience a 33.8% improvement by cost over a baseline rating for building energy performance, thanks in part to the ground source heat exchange system, and efficient building envelope. 75% of construction and demolition debris associated with the project was diverted from landfills through reuse and recycling efforts. 20% of the materials used in construction were extracted, harvested, recovered, or manufactured within a 500 mile radius of the building site. Close to 100% of the wood used in construction was certified sustainable by the Forest Stewardship Council (FSC).¹⁴

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GREEN BUILDING CITY MARKET BRIEF

HOUSTON

TEXAS

**A CITY-WIDE MOVEMENT**

The city of Houston implemented the Green Office Challenge, an initiative to facilitate commercial property managers and their tenants to compete against other properties along sustainability metrics. The program provides resources regarding building energy efficiency as well as potential sustainability measures, and uses the Green Office Scorecard to evaluate building operations.¹

LEADING BY EXAMPLE

In June 2004, the Houston City Council adopted Resolution No. 2004-15 requiring the new construction and major renovation of municipal buildings with more than 10,000 square feet to adhere to LEED guidelines. The legislation does not set a definitive certification requirement, but mandates capital improvement projects to follow LEED principles "to the greatest extent practical and reasonable."²

BENCHMARKING

As a Department of Energy Better Buildings Challenge Community Partner, the city of Houston benchmarks 100% of its municipal building energy use.³

PRIVATE SECTOR INCENTIVES

In conjunction with its participation in the Green Office Challenge, the city of Houston launched an Energy Efficiency Incentive Program for commercial buildings. The program will provide incentives to office building managers and owners within the city to reduce energy consumption and increase the economic performance of their building. It supplied capital to cover 40% to 60% of the up-front labor and material costs up to \$500,000 per building upon completion of the project.⁴

CITY EMISSIONS TARGET:

The city of Houston aims to achieve a 36% reduction in greenhouse gas emissions by 2016, compared with 2007 emission levels.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	X
Energy Benchmarking and Data Transparency	✓
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	2.1 million
Land Area (km ²)	1,026
Gross Domestic Product (in USD billions)	400
Average Walk Score ⁵	44/100
Annual Rainfall (mm/year)	1,264
Climate Action Plan	No

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁶	37,030,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Houston) ⁷	3,150
--	-------

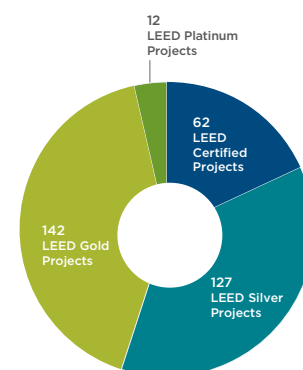
PROJECT BREAKDOWN

366
LEED Certified Projects
(Houston)

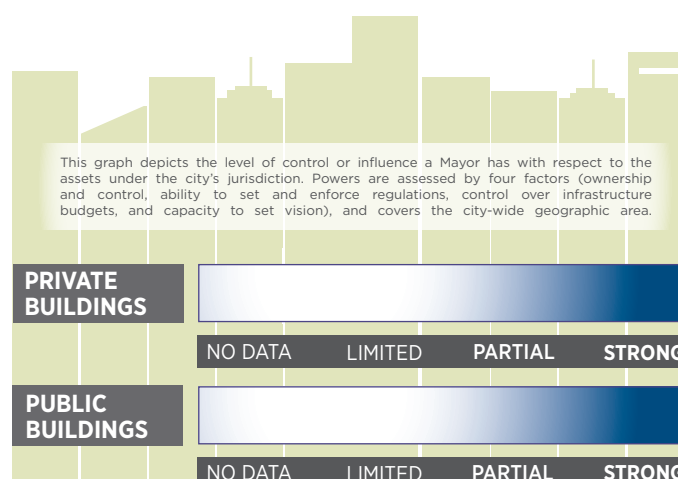
547
LEED Registered
Projects (Houston)

1,383
LEED Certified Projects
(Texas)

2,257
LEED Registered
Projects (Texas)



Graph depicts the distribution of LEED certified projects in Houston

MAYORAL POWERS

POLICY SPOTLIGHT:

In August 2008, Houston adopted an Emissions Reduction Plan that established the city's emissions reductions goal and outlined effective strategies that will aid in achieving its goal. Building and energy specific measures include: the incorporation of renewable energy in city projects, facility retrofits, installation of LED traffic signals, LEED certification for city buildings, and a citywide lighting retrofit project.⁸

GREEN AFFORDABLE HOUSING

The city of Houston began piloting its program to improve energy efficiency in lower income communities in 2006 through a partnership with the local utility. Efficiency increases of upwards of 20% were achieved through simple weatherization measures, and with payback periods of approximately two years. On average, homeowners saved about \$335 within the first six months after the improvements compared to the previous year.⁹

GREEN SCHOOLS

The Houston Independent School District has committed to building all of its new facilities to LEED standards. Each summer the district offers the Student Conservation Association Community Crew Program. Houston aims to build the next generation of conservation leaders and environmental stewards by getting local students out into their communities and environment to do hands-on service work.¹⁰

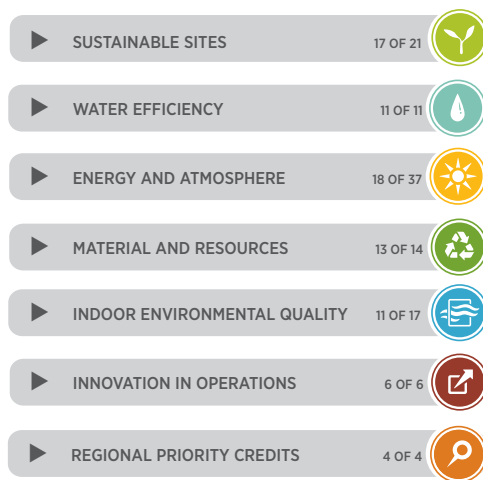
PROJECT SPOTLIGHT:

Hines Williams Tower

The 33-story tower owned by Hines was the first downtown office building to receive LEED certification from USGBC when it was awarded Gold Certification under the LEED for Existing Buildings rating system in November 2009. Through upgrades and the installation of modern fixtures, Hines made additional sustainable upgrades to the 696,000 square foot building and achieved Platinum Certification under the Commercial Interiors rating system in April 2014.¹¹

LEED Scorecard

Platinum 80/110



PROJECT SPOTLIGHT:

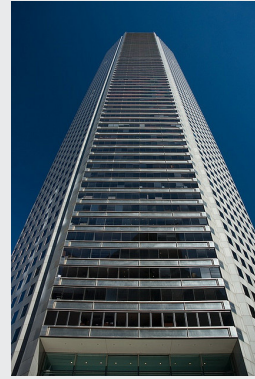


Photo courtesy of Flickr Creative Commons user Tom Haymes

Chase Tower

Houston's Chase Tower achieved Gold certification under the LEED for Existing Buildings, Operations and Maintenance rating system in September 2014. The building's design resulted in a 30% reduction in indoor potable water use and a 100% reduction in potable water use in landscaping, both against a modeled baseline. The property reuses or recycles durable goods at a rate of 75%. Occupants experienced a 31% reduction in conventional commuting trips. The structure also achieved a 77 ENERGY STAR® Performance Rating.¹²

LEED Scorecard

Gold 63/110



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GREEN BUILDING CITY MARKET BRIEF

LOS ANGELES

CALIFORNIA

**LEADING BY EXAMPLE**

In 2002, the city of Los Angeles established one of the earliest ordinances mandating all city-owned and city-funded construction projects, 7,500 square feet or larger, to earn LEED certification.¹ This requirement was expanded to the private sector in 2008 for all new buildings greater than 50,000 square feet and significant renovations in the same size buildings.²

BENCHMARKING

Through the Department of Energy's Better Building Challenge, Los Angeles has benchmarked 250 of its most energy-intensive municipal facilities. It has pledged a 20% reduction in energy intensity for city and privately owned buildings by 2020.³ Additionally, as a member of the City Energy Project,⁴ Los Angeles is interested in pursuing a private sector ordinance for benchmarking and disclosure.

PRIVATE SECTOR INCENTIVES

Los Angeles Department of Water and Power's Green Building Incentive Program offers financial incentives for buildings that are LEED certified. The incentive is determined by a cents-per-square-foot calculation, directly associated with the number of points earned in the LEED energy category. The incentive rate increases for each additional point earned.⁵

GREEN SCHOOLS

The Los Angeles Unified School District (LAUSD) has more than 14,000 buildings and 700,000 students spread out over 710 square miles. The green schools program has used \$14 billion in funding for new school construction. By the end of 2009, a multi-phase review of 34 new green schools had been completed. The resulting plan improved the school facilities for more than 40,000 students and teachers, saving 21,695,238 gallons of water, 164,357,593 kWh of electricity, and reducing CO2 emissions by more than 94,000 tons every year -- the equivalent of planting 282,000 trees or eliminating more than 15,000 cars from the road every year.⁶

CITY EMISSIONS TARGET:

With the upcoming release of the city's new Sustainable City pLAn, Los Angeles aims to achieve an 80% reduction in greenhouse gas emissions by 2050, with the short term target of a 30% reduction in greenhouse gas emissions by 2017, both compared to 1990 levels.

CITY DETAILS

Population	4.1 million
Land Area (km ²)	1,216
Gross Domestic Product (in USD billions)	789.7
Average Walk Score ⁷	64/100
Annual Rainfall (mm/year)	372
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁸	33,940,000
% of Emissions from the Building Sector	51%
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Los Angeles) ⁹	3,459
--	-------

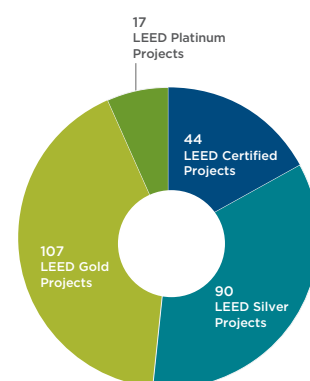
PROJECT BREAKDOWN

258
LEED Certified Projects
(Los Angeles)

366
LEED Registered
Projects (Los Angeles)

3,345
LEED Certified Projects
(California)

4,585
LEED Registered
Projects (California)



Graph depicts the distribution of LEED certified projects in Los Angeles

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✓
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

POLICY SPOTLIGHT:

In August 2014, the Los Angeles Department of Water and Power adopted a goal to increase operational energy efficiency by 15% by 2020. The new energy efficiency target brings significant environmental as well as economic benefits to Los Angeles. The 15% goal represents a total of 3,596 GWh in energy use reduction, which equates to the benefits of removing 440,000 cars from L.A.'s streets each year. The energy efficiency programs is poised to create 16 jobs for every \$1 million invested.¹⁰

GREEN RESIDENTIAL BUILDINGS

Los Angeles' Residential Green Building Standards Code is intended to improve public health, safety, and general welfare by enhancing the design and construction of buildings to reduce negative impacts on environmental and human health.¹¹

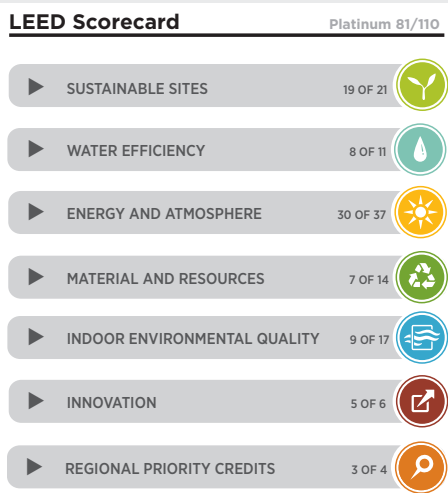
ENERGY STAR BUILDINGS

Los Angeles ranked first among U.S. cities in ENERGY STAR® buildings certified in 2013. 443 buildings, with a total floor space of 102.7 million square feet, were certified under the program. The estimated cost savings associated with the certifications is \$132.2 million.¹²

PROJECT SPOTLIGHT:

UCLA School of Public Health

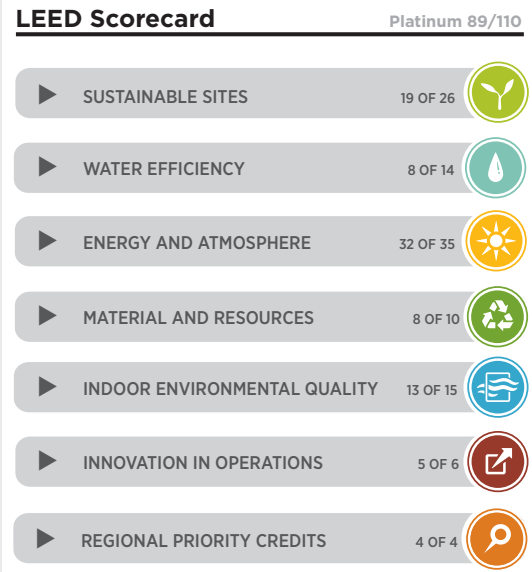
The University of California-Los Angeles' School of Public Health achieved Gold certification under the LEED for Commercial Interiors in September 2014. The design resulted in a 35% reduction in indoor potable water use, compared with a modeled baseline. 90% of equipment in the facility is ENERGY STAR® qualified. Construction and demolition debris associated with the project was diverted from landfills at a rate of 75%. 30% of the furniture in the space is salvaged, refurbished, or used.¹³



PROJECT SPOTLIGHT:

Ernst and Young Plaza

Los Angeles' Ernst and Young Plaza achieved Platinum Certification under the LEED for Existing Buildings in July 2012. Ongoing consumables are reused, recycled or composted at a rate of 50% and durable goods are reused or recycled at a rate of 75%. The building's design resulted in a 30% reduction in indoor potable water use, compared with a modeled baseline. The building also achieved a 95 ENERGY STAR® Performance Rating.¹⁴



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GREEN BUILDING CITY MARKET BRIEF

NEW ORLEANS

LOUISIANA



PRIVATE SECTOR INCENTIVES

Energy Smart New Orleans was a program developed by city council, intended to help residents save energy and money through energy assessments and cash rebates on energy efficiency improvements. The program, running from April 2011 to March 2014, awarded up to \$5,000 for home energy improvements that allow residents to save on their utility bills.¹

GREEN SCHOOLS

The Center for Green Schools Fellowship Program has its roots in 2008, in the Katrina-stricken Recovery School District in New Orleans. USGBC saw the profound impact and value of having a sustainability champion providing on-the-ground support and expertise needed to rebuild the community's devastated school infrastructure. Led and supported by USGBC's New Orleans Green Building Coordinator, the district has since fully embraced environmentally sound practices: 35 LEED®-certified or registered schools are now open or under construction and tremendous improvements have been made to facility operations and maintenance practices.

Be Energy Smart is an in-class educational program open to Orleans Parish middle schools. The program helps students adopt an energy efficient lifestyle, and achieve energy reductions by installing items in Be Smart Energy Kits in their homes. Kits include four compact fluorescent light bulbs, one low-flow showerhead, one standard faucet aerator, one kitchen faucet aerator and one LED nightlight. If a participating class achieves 100% participation in the Energy Kit portion of the program the class receives a pizza party.²

SUSTAINABLE COMMUNITIES

In 2010, the State of Louisiana created and funded Greater New Orleans, Inc (GNO, Inc). Its goal is to develop a comprehensive, integrated and sustainable water management strategy for the city using a Federal Community Development Block Grant. In 2013, the Greater New Orleans Urban Water Plan was adopted with the intention of creating long-term urban water management.³

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✗
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✗
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	378,715
Land Area (km ²)	900
Gross Domestic Product (in USD billions)	71.9
Average Walk Score ⁴	96/100
Annual Rainfall (mm/year)	1,265
Climate Action Plan	No

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁵	4,470,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (New Orleans) ⁶	475
--	-----

PROJECT BREAKDOWN

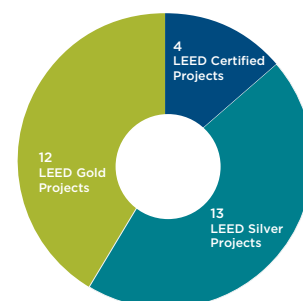


30
LEED Certified Projects
(New Orleans)

107
LEED Registered
Projects (New Orleans)

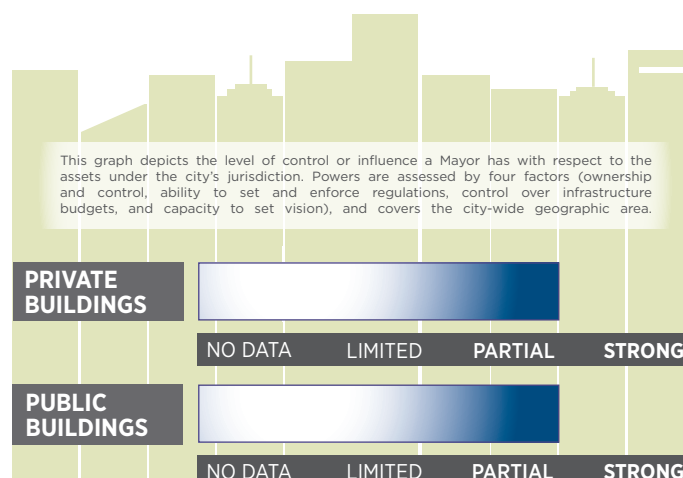
78
LEED Certified
Projects (Louisiana)

223
LEED Registered
Projects (Louisiana)



Graph depicts the distribution of LEED certified projects in New Orleans

MAYORAL POWERS



REBUILDING

Make It Right was founded post-Katrina, in 2007, with the mission to build homes, buildings, and communities for people in need. Make It Right homes meet the highest standards in green building; they are LEED Platinum certified and inspired by Cradle to Cradle thinking. Striving to change the building industry, Make It Right is focused on making energy-efficient, healthy homes affordable for everyone.

Their work in New Orleans is a laboratory for cost-effective green building; taking what they have learned on their inaugural project and using it to help other communities in need like Newark, NJ and Kansas City, MO.

Make It Right has created an online library and laboratory to share their knowledge with the public. The materials they use, their construction methods, lessons learned, recent discoveries and data are now available to homeowners, designers, builders and anyone who is interested in learning more.⁷

PROJECT SPOTLIGHT:

New Orleans Bio Innovation Center

New Orleans' Bio Innovation Center achieved Gold Certification under the LEED for New Construction rating system in June 2012. The building's design resulted in a 50% reduction in potable landscape water use and a 20% reduction in indoor water use, both against a modeled baseline. The structure also achieved a 21% improvement on baseline building performance rating and participates in a 35% green power purchase agreement.¹⁰

LEED Scorecard

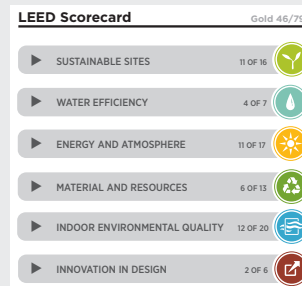
Gold 43/69



PROJECT SPOTLIGHT:

Andrew H. Wilson Elementary School

New Orleans' Andrew H. Wilson Elementary School achieved Gold certification under the LEED for Schools rating system in November 2011.⁹



PROJECT SPOTLIGHT:

Hughes Elementary School

Hughes Elementary School achieved Silver certification under the LEED for Schools rating system in June 2011.¹⁰



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GREEN BUILDING CITY MARKET BRIEF

NEW YORK CITY **NEW YORK****A CITY-WIDE MOVEMENT**

New York City is committed to an energy efficient, low-carbon future that is equitable for all residents. During Climate Week in September 2014, New York City announced an ambitious goal to reduce city-wide greenhouse gas (GHG) emissions by 80% by 2050 from a 2005 baseline. This goal is supported by One City: Built to Last, a city-wide, ten-year plan to reduce private sector building-based emissions by 30% by 2025 and public sector building-based emissions by 35% by 2025. The plan targets private buildings of all sizes and every city-owned building with significant energy use, and is expected to reduce 3.4 million metric tons of carbon dioxide equivalent (MTCO₂e), saving nearly \$8.4 billion and generating 3,500 construction related jobs.¹

LEADING BY EXAMPLE

With a focus on government operations, the city has reduced energy use and GHG emissions through comprehensive and innovative programs that include retrofits, operations and maintenance, renewable energy, a clean fleet, methane capture in wastewater treatment plants, and deploying new technologies. Additionally, the Accelerated Conservation and Efficiency Program will commit \$39 million over ten years to fast track energy capital projects that will annually reduce 13,800 MTCO₂e.²

PRIVATE SECTOR LEADERSHIP

New York City has called on its partners in the private sector to participate in the NYC Carbon Challenge. Since 2011, most of the city's largest universities, hospitals, global companies, Broadway theaters and residential management firms have accepted the challenge, pledging to reduce building-based emissions by 30% or more in 10 years.³

BENCHMARKING

Under the Greener, Greater Buildings Plan (GGBP), Local Law 84 (LL84) requires owners of buildings larger than 50,000 square feet to annually measure their energy consumption through the U.S. Environmental Protection Agency's benchmarking tool, ENERGY STAR® Portfolio Manager. The process includes determining if a building needs to be benchmarked, measuring the building's energy and water usage, and submitting the usage data online annually to the city. The goal is to increase transparency about energy and water usage for both building owners and tenants.

CITY EMISSIONS TARGET:

New York City aims to achieve an 80% reduction in citywide greenhouse gas emissions by 2050, compared with 2005 levels.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✓
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	8.4 million
Land Area (km ²)	790
Gross Domestic Product (in USD billions)	1,210
Average Walk Score ⁴	88/100
Annual Rainfall (mm/year)	1,244
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁵	53,360,000
% of Emissions from the Building Sector	73.9%
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (New York City) ⁶	6,818
--	-------

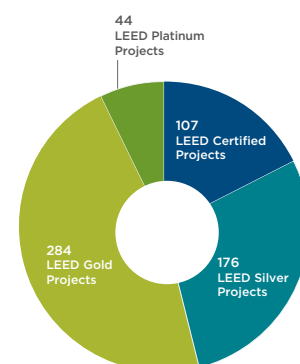
PROJECT BREAKDOWN

611
LEED Certified
Projects (NYC)

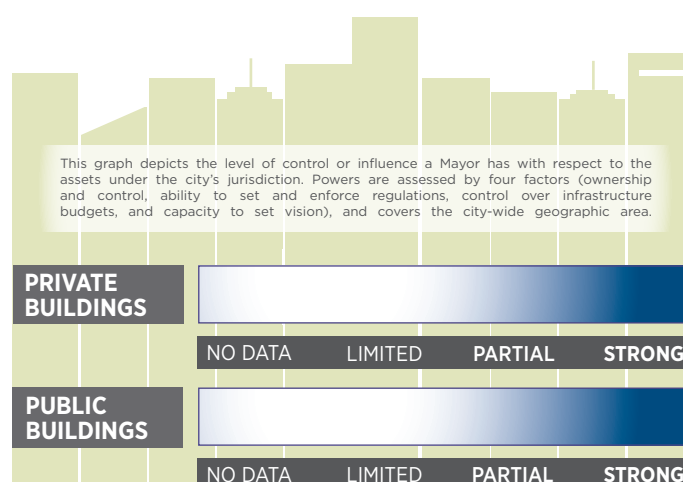
1,058
LEED Registered
Projects (NYC)

1,261
LEED Certified
Projects (New York)

2,262
LEED Registered
Projects (New York)



Graph depicts the distribution of LEED certified projects in New York City

MAYORAL POWERS

POLICY SPOTLIGHT:

The Greener, Greater Buildings Plan:

- Consists of four regulatory pieces (Local Laws 84, 85, 87, 88) that address benchmarking, energy audits and retro-commissioning, as well as the adoption of a new energy code all working towards increased energy efficiency for the city.
- Supplemented by job training opportunities and a financing entity called the New York City Energy Efficiency Corporation (NYCEEC).
- Estimated to reduce city-wide GHG emissions by roughly 5%, result in a net savings of \$7 billion, and create thousands of jobs by 2030.

GREEN CODES

Based on 2009 IECC and ASHRAE 90.1-2007, the New York City Energy Conservation Code (NYCECC) provides criteria for residential and non-residential buildings and addresses issues such as thermal envelope components and energy efficiency requirements for HVAC, hot water, lighting and auxiliary systems. These codes and other related initiatives such as the Green Codes Task Force and Zone Green are working towards increased energy efficiency through the use of tools such as air-tightness requirements for most building types, pre-occupancy commissioning of commercial and multi-family residential buildings, lighting and sub-metering requirements, energy audit requirements for large buildings, and LEED Silver certification requirements for most city-owned/funded buildings.

PRIVATE SECTOR INCENTIVES

In 2008, the State of New York adopted legislation allowing a property tax abatement for the installation of a green roof in cities with a population of 1 million or more. It is a one-year tax abatement of \$4.50 per square foot, up to \$100,000. Green roofs improve water quality by filtering rainwater before it joins local rivers and water bodies. They can also capture excess water during heavy storms, helping to prevent the city's sewer system from overflowing into local bodies of water.⁷

GREEN AFFORDABLE HOUSING

In 2011, New York City Department of Housing Preservation and Development (HPD) created legislation that requires new construction and substantial rehabilitation projects receiving HPD funding to achieve certification under the national Enterprise Green Communities program, which is specifically designed for the affordable housing sector.

GREEN SCHOOLS

The New York City Department of Education has created a sustainability plan which works towards increasing recycling rates and water efficiency in schools, decreasing greenhouse gas emissions, and ensuring that new school projects are built to sustainable standards. The initiative also works to ensure that sustainable practices are taught in the school curriculum.

SUSTAINABLE COMMUNITIES

In 1996, the city created the Department of Design and Construction (DDC) in order to ensure that civic buildings were designed and constructed to the highest level of quality, efficiency, and sustainability. In 1999, in partnership with the Design Trust for Public Space, DDC published the High Performance Building Guidelines, the first document of its kind outlining both technical and best practice guidelines for the design of sustainable buildings.

RETROFITS

In order to help increase potential cost and energy savings, Local Law 87 requires any building 50,000 sq. ft. or larger to undergo energy audit and retro-commissioning measures every 10 years. The hope is that by creating a greater awareness of building performance, building owners will eventually shift the market towards increasingly efficient, high-performing buildings. Buildings that fall within the given criteria must create an Energy Efficiency Report (EER) detailing the findings.

PROJECT SPOTLIGHT:

The Solaire

The Solaire, located in Battery Park City, achieved Gold Certification under the LEED for New Construction rating system in April 2004. It elected to recertify to the Platinum level under the LEED for Existing Buildings rating system in September 2009. The project's design resulted in a 10% reduction in indoor potable water use and 50% reduction in potable landscape water use.⁸

LEED Scorecard

Platinum 70/76

▶	SUSTAINABLE SITES	13 OF 14	
▶	WATER EFFICIENCY	5 OF 5	
▶	ENERGY AND ATMOSPHERE	12 OF 13	
▶	MATERIAL AND RESOURCES	16 OF 16	
▶	INDOOR ENVIRONMENTAL QUALITY	18 OF 22	
▶	INNOVATION IN OPERATION & MANAGEMENT	6 OF 6	

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GREEN BUILDING CITY MARKET BRIEF

PHILADELPHIA

PENNSYLVANIA



LEADING BY EXAMPLE

In 2009, the city of Philadelphia passed Bill No. 080025, it is intended to be an effective tool for fostering integrated design and high-performance construction in major city building projects. The LEED-silver requirement applies to construction projects over 10,000 square feet that are primarily funded by city capital dollars and are controlled by the city. To emphasize energy efficiency, the ordinance requires that projects be designed and constructed to use at least 20% less energy than basic, code-compliant structures. The ordinance applies to capital projects undertaken by all departments and agencies across the city, including the airport, water department, and public property. Projects that do not fit the criteria laid out in this legislation can choose to meet or exceed this standard. All city construction projects will be encouraged to consider energy efficiency during design initiation.¹

GREEN CODES

Philadelphia's innovative zoning code is intended to encourage sustainable development and redevelopment within the city. Primary goals of the code are reducing the number of vehicle miles traveled, encouraging renewable energy and energy conservation, encouraging water conservation and supporting urban food production. The code allows floor area bonuses for new development and retrofit projects that achieve LEED Gold or Platinum Certification.²

PRIVATE SECTOR INCENTIVES

Philadelphia offers a tax credit for the installation of green roofs in the city. Buildings opting to install a green roof are eligible to receive a credit against Philadelphia's business income and receipts tax for 25% of all costs associated with the installation.³

CITY EMISSIONS TARGET:

Philadelphia aims to achieve a 20% reduction in greenhouse gas emissions by 2015, compared with 1990 levels.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✓
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✗
Neighborhood-Scale Sustainability	✗

CITY DETAILS

Population	1.5 million
Land Area (km ²)	369
Gross Domestic Product (in USD billions)	342.2
Average Walk Score ⁴	77/100
Annual Rainfall (mm/year)	1,146
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁵	19,780,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Philadelphia) ⁶	2,184
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PROJECT BREAKDOWN

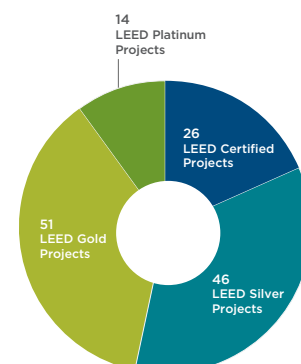


137
LEED Certified Projects
(Philadelphia)

249
LEED Registered
Projects (Philadelphia)

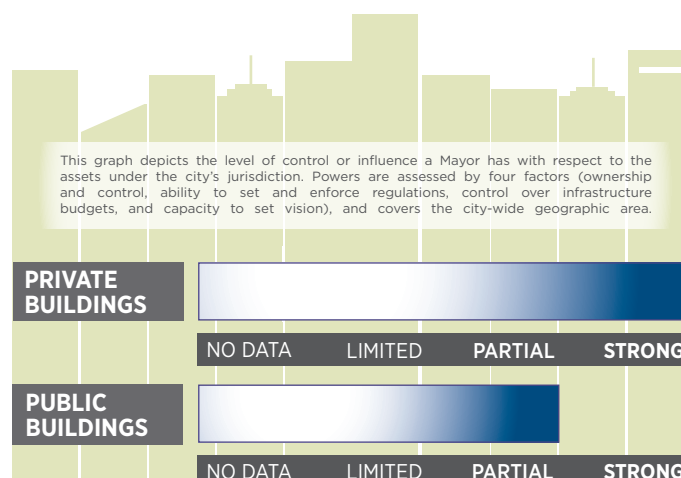
838
LEED Certified Projects
(Pennsylvania)

1,261
LEED Registered
Projects (Pennsylvania)



Graph depicts the distribution of LEED certified projects in Philadelphia

MAYORAL POWERS



POLICY SPOTLIGHT:

In 2009, the city of Philadelphia released its sustainability plan entitled Greenworks. It consists of 15 sustainability targets, to be achieved by 2015, intended to make the city the greenest in the United States. The plan includes specific building and energy targets including: lowering city government energy consumption by 30%, reducing city-wide building energy consumption by 10%, completing the sustainable retrofit of 15% of the housing stock, and purchasing or generating 20% of electricity used in Philadelphia from alternative energy sources.⁷

BENCHMARKING

The city mandates energy benchmarking for commercial spaces with an indoor floor space of 50,000 square feet or more using the ENERGY STAR® Portfolio Manager. The policy covers all buildings within Philadelphia, and aligns with the city's goal of reducing citywide building energy use by 10% by 2015.⁸

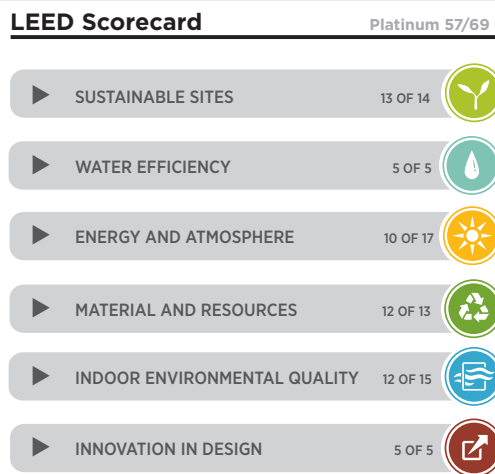
SUSTAINABLE COMMUNITIES

Philadelphia's Green Streets Program consists of advanced stormwater strategies with the goal of reducing runoff and watershed pollution. The city's water department developed the program standards, which include stormwater tree trenches, stormwater planters, stormwater bumpouts and pervious pavements.⁹

PROJECT SPOTLIGHT:

Friends Center Philadelphia

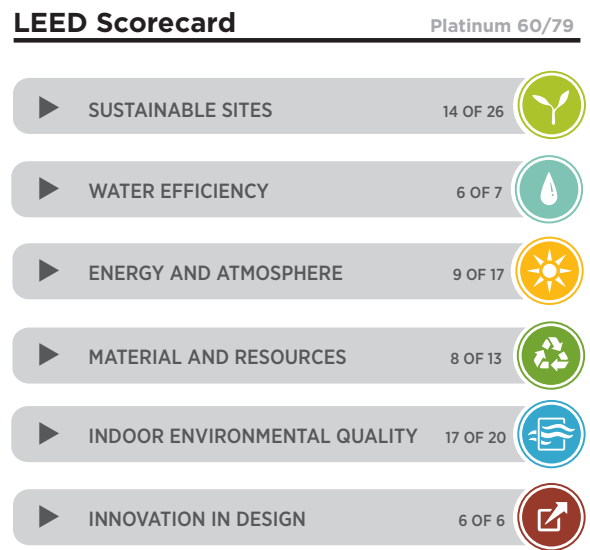
Philadelphia's Friends Center achieved Platinum certification under the LEED for New Construction rating system. The building's design resulted in a 50% reduction in potable water use in landscaping and a 20% reduction in indoor potable water use, both against a modeled baseline. 20% of materials used in construction were extracted, harvested, recovered, or manufactured within a 500 mile radius of the building site.¹⁰



PROJECT SPOTLIGHT:

Kensington CAPA High School

Philadelphia's Kensington Creative and Performing Arts (CAPA) High Schools achieved Platinum Certification under the LEED for Schools rating system in March 2011. Sustainable building strategies including a greywater system, geothermal heating and cooling, green roofs, and sustainable building materials and products were utilized in the design and construction of Kensington CAPA. The site of the school is a former brownfield, which was developed through environmental remediation to meet Pennsylvania Land Recycling and Remediation Standards (Act 2). Design and implementation of a storm water management program, including the use of green roofs, porous paving, and a greywater system, was employed to manage all storm water on site.¹¹



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GREEN BUILDING CITY MARKET BRIEF

PORTLAND

OREGON



LEADING BY EXAMPLE

Portland engages developers, building owners and the design community through partnerships and incentive programs to improve performance in the built environment. Example activities include green building tours, educational events and partnerships like the Kilowatt Crackdown – a competition among Portland's buildings to drive energy savings and reduce operating costs. This initiative provides free training, technical support and data review to track energy performance using ENERGY STAR.¹

GREEN CODES

Portland's green building policy for city-owned facilities requires that new, occupied facilities achieve Gold Certification under the LEED for New Construction rating system. Additionally, all new city-owned facilities are to recycle at least 85% of construction waste, improve water efficiency, reduce potable water use for landscaping purposes, achieve a 30% energy cost savings beyond applicable LEED baseline requirements, and employ enhanced building commissioning strategies.²

PRIVATE SECTOR INCENTIVES

Portland's landscape of incentive providers includes Energy Trust of Oregon (ETO), an independent nonprofit organization dedicated to helping utility customers save energy and generate renewable power. Through dedicated funding by utility users, ETO dispenses a wide range of incentives for energy efficiency measures and installation of renewables on homes, businesses and industrial applications. In addition, the city of Portland used ARRA funds and leveraged partnerships to launch Clean Energy Works Oregon (CEWO) to finance energy efficiency retrofits through a revolving loan fund. Two innovative components – on-bill financing and a Community Workforce Agreement – distinguish CEWO from other retrofit programs.³

CITY EMISSIONS TARGET:

The city of Portland aims to achieve an 80% reduction in green house gas emissions by 2050, compared with 1990 emissions.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	X
Energy Benchmarking and Data Transparency	X
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	X
Neighborhood-Scale Sustainability	X

CITY DETAILS

Population	609,456
Land Area (km ²)	376
Gross Domestic Product (in USD billions)	147
Average Walk Score ⁴	63/100
Annual Rainfall (mm/year)	915
Climate Action Plan	Yes (county)

BUILDING PERFORMANCE EMISSIONS

County-wide Emissions (metric tons CO ₂ e) ⁵	7,640,000
% of Emissions from the Building Sector	45%
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Portland) ⁶	2,837
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PROJECT BREAKDOWN

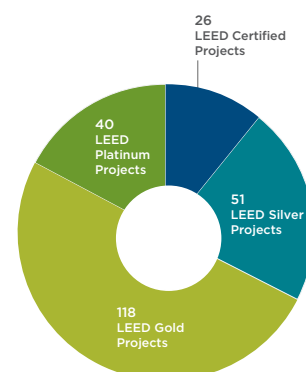


235
LEED Certified Projects
(Portland)

213
LEED Registered
Projects (Portland)

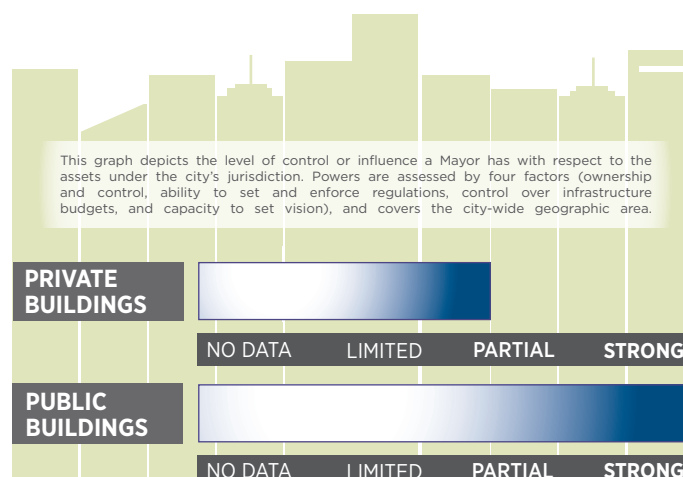
452
LEED Certified Projects
(Oregon)

398
LEED Registered
Projects (Oregon)



Graph depicts the distribution of LEED certified projects in Portland

MAYORAL POWERS



POLICY SPOTLIGHT:

In 2009, the city of Portland and Multnomah County enacted a climate action plan that will put the city and the county on the path to achieving reduction targets of 40% by 2030 and 80% by 2050. The plan contains building and energy objectives for the city to reach by 2030, such as, reducing the total energy use of all buildings built before 2010 by 25%, achieving zero net greenhouse gas emissions in all new buildings and homes, producing 10% of the total energy used within the county from onsite renewable sources and ensuring that new buildings, as well as major renovations, can adapt to climate change.⁷

GREEN AFFORDABLE HOUSING

Portland has established guidelines for the greening of new and existing affordable housing developments, so that residents can enjoy the benefits of decent and healthy housing regardless of income level. Development partners often go beyond these guidelines to incorporate aggressive strategies that reduce energy use, integrate on-site renewables and ensure long-term affordability for residents.⁸

SUSTAINABLE COMMUNITIES

The Portland Plan's Healthy Connected City Strategy is intended to accelerate the shift to active transportation modes such as transit, walking and cycling while revitalizing neighborhoods and supporting the health, affordability and livability of communities. The initiative is based on a "20-minute neighborhood" analysis that assesses proximity to basic services such as medical offices, banks, grocery stores, parks and a variety of additional services.⁹

PROJECT SPOTLIGHT:

George R. White Library & Learning Center

Concordia University's George R. White Library & Learning Center achieved Platinum certification under the LEED for New Construction rating system in July 2010. The building's design resulted in a 20% reduction in indoor potable water use, compared with a modeled baseline. Construction and demolition debris was diverted from landfills at a rate of 50%. 20% of materials used in construction were extracted, harvested, recovered, or manufactured within a 500 mile radius of the building site.¹⁰

PROJECT SPOTLIGHT:



Photo courtesy of Flickr Creative Commons user Oregon Convention Center

Oregon Convention Center

The Oregon Convention Center achieved Platinum Certification under the LEED for Existing Buildings rating system in March 2014. Ongoing consumables are reused, recycled or composted at a rate of 50%. 60% of ongoing consumables are sustainably purchased. Occupants experienced a 44% reduction in conventional commuting trips. The building also achieved an 85 ENERGY STAR® Performance Rating.¹¹

LEED Scorecard

Platinum 83/110

▶ SUSTAINABLE SITES	19 OF 26	
▶ WATER EFFICIENCY	8 OF 14	
▶ ENERGY AND ATMOSPHERE	28 OF 35	
▶ MATERIAL AND RESOURCES	8 OF 10	
▶ INDOOR ENVIRONMENTAL QUALITY	10 OF 15	
▶ INNOVATION IN OPERATIONS	6 OF 6	
▶ REGIONAL PRIORITY CREDITS	4 OF 4	

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GREEN BUILDING CITY MARKET BRIEF

SAN FRANCISCO

CALIFORNIA



LEADING BY EXAMPLE

Increasing water, energy, and material efficiency is at the core of San Francisco's sustainability goals, which include reducing climate change emissions 80% below 1990 levels by 2040, and Zero Waste by 2020. San Francisco has been committed to sustainable, equitable, and healthy buildings since its 1997 Sustainability Plan and the nation's first green building requirements for city buildings in 1999.

Recognizing that buildings designed, built, and certified to LEED standards are more comfortable, healthy, durable, as well as energy and water efficient, municipal requirements were updated in 2004 to require LEED Silver certification for new buildings and leased property improvements of 5,000 square feet or larger. In 2011, the city raised the bar again, amending Environment Code chapter 7 to require LEED Gold certification. To date, more than 4 million square feet of municipal facilities totaling \$6.4 billion in capital investment have met these requirements, or are on track to meet them.¹

GREEN CODES

In 2008, inspired by municipal projects and market uptake of LEED, San Francisco established green building requirements for all new construction citywide, as well as major alterations to large buildings. San Francisco Green Building Code (updated in 2013) – augments California Green Building Standards (CalGreen), requiring new commercial buildings larger than 25,000 square feet and major renovations to meet LEED Gold, new residential to achieve either LEED for Homes Silver or a GreenPoint rating, and all smaller alterations to meet CalGreen (2013).²

BENCHMARKING

San Francisco's 2011 Existing Commercial Buildings Energy Performance Ordinance requires non-residential buildings (public and private) over 10,000 square feet to annually benchmark energy data using ENERGY STAR® Portfolio Manager. The ordinance also requires energy audits or retro-commissioning every 5 years, and that annual energy consumption be displayed on a municipal website for public view.³

CITY EMISSIONS TARGET:

San Francisco's goals for greenhouse gas emissions reduction are: 25% below 1990 by 2017, 40% by 2025 and 80% by 2040. By 2010, emissions were 14% below 1990 levels.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✓
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✗

CITY DETAILS

Population	835,000
Land Area (km ²)	600
Gross Domestic Product (in USD billions)	306.6
Average Walk Score ⁴	84/100
Annual Rainfall (mm/year)	600.46
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁵	5,010,000
% of Emissions from the Building Sector	54%
Municipal Emissions (metric tons CO ₂ e)	128,065

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (San Francisco) ⁶	5,798
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PROJECT BREAKDOWN

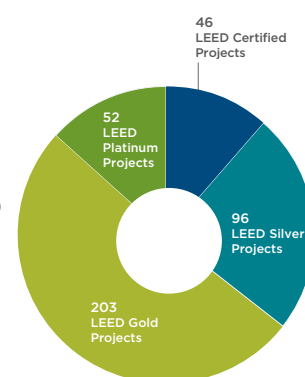


397
LEED Certified Projects
(San Francisco)

433
LEED Registered
Projects (San Francisco)

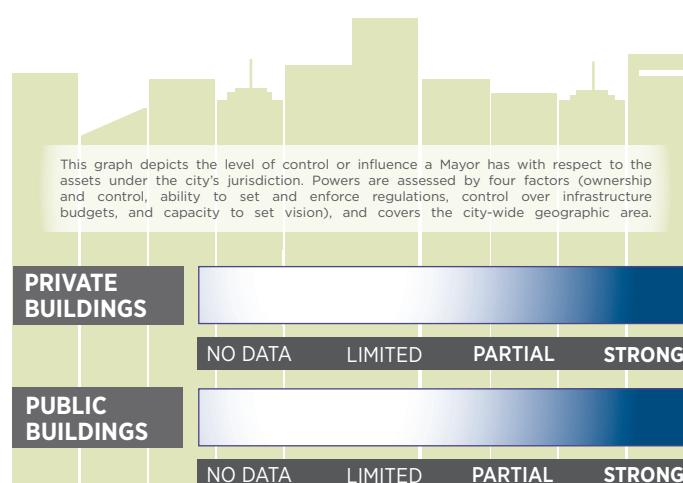
3,345
LEED Certified Projects
(California)

4,585
LEED Registered
Projects (California)



Graph depicts the distribution of LEED certified projects in San Francisco

MAYORAL POWERS



POLICY SPOTLIGHT:

In addition to LEED-related legislation, San Francisco has key complementary policies, including:

- All buildings must provide for convenient collection, storage and loading of recyclable and compostable materials, as well as updating plumbing fixtures and fittings at time of alteration or sale.
- New buildings must including façade treatments and lighting designed to minimize hazards for migratory birds.
- Particulate filtration (MERV 13) is required for supply air for sensitive populations in areas with particulate pollution.
- The city planning and building departments prioritize permit review to new and renovated buildings that commit to LEED Platinum, Passive House, or Zero Net Energy certification – accelerating completion and reducing project financing at no cost to the city.⁷

PRIVATE SECTOR INCENTIVES

The nation's largest municipal solar energy incentive program, "GoSolarSF" – administered by the San Francisco Public Utilities Commission (SFPUC) – provides incentives to residents and businesses who install photovoltaic (PV) systems on their properties. Systems must be at least one kilowatt (kW) in capacity, and business & multifamily rebates can reach \$50,000 per site. Low-income housing and non-profits are eligible to receive the highest incentives. The SFPUC also provides city construction projects with commissioning and building enclosure commissioning services, as well as LEED operation and maintenance services.⁸

The San Francisco Energy Watch program, delivered by the city and Pacific Gas & Electric Company, has provided incentives, technical services, and quality control for energy efficiency upgrades to more than 10,000 multifamily and commercial properties – reducing annual energy costs for San Franciscans by \$41 million.

GREEN RESIDENTIAL DEVELOPMENT

Affordable housing developers are leaders in green building throughout the San Francisco Bay Area, and between 2008 and 2011 more than 800 permanently affordable housing units in San Francisco were delivered, with thousands more in development.

To help market-rate properties, the Multiple Listing Service (or MLS) includes data fields for building certifications such as LEED, GreenPoint Rated, ENERGY STAR® and HERS – and a 2010 UCLA/UC Berkeley study found that homes in California with credible green labels were selling for 9% above market rate.⁹

For existing homes, the Residential Energy Conservation Ordinance requires basic retrofits at time-of-sale for residential properties built before the California Energy Code was adopted in 1978. The Energy Upgrade California program provides incentives for more extensive whole-home upgrades.

GREEN SCHOOLS

San Francisco's Unified School District administers sustainability programming in schools throughout the city. The district implements green cleaning initiative, provides funding for garden projects, and supports green teams consisting of students, parents, and teachers.¹⁰

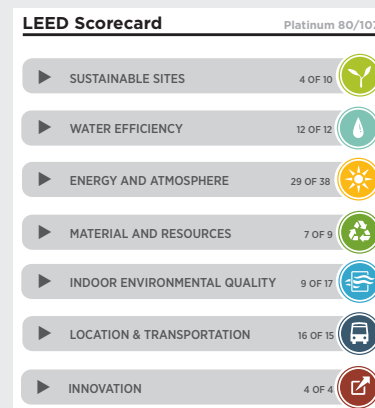
SUSTAINABLE COMMUNITIES

To help the city reach its goal of zero waste by 2020, the city of San Francisco implemented the Zero Waste program. The program contains a number of initiatives including mandatory three-stream source separation and recycling of waste. The city established "pay as you throw" waste hauling rates, providing up to 75% discount for homes and businesses that minimize waste. Additionally, San Francisco has banned the use of non-recyclable or non-compostable food service containers and has eliminated the use of plastic bags in stores.¹¹

PROJECT SPOTLIGHT:

One Sansome Street

San Francisco's One Sansome Street achieved Platinum certification under the brand new LEED v4 Existing Buildings: Operations and Management rating system in September 2014. The structure had previously achieved Gold Certification under LEED for Existing Buildings v3 in January 2010.¹²



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GREEN BUILDING CITY MARKET BRIEF

SEATTLE

WASHINGTON



LEADING BY EXAMPLE

In October 2011, with City Council Resolution 31326, Seattle expanded its Sustainable Building Policy, requiring all new and renovated city-funded projects, 5,000 square feet or larger, to achieve Gold certification under the appropriate LEED green building rating system, as well as meet minimum requirements for energy and water efficiency, construction waste management, and bicycle facilities.¹

GREEN CODES

The 2012 Seattle Energy Code includes an outcome-based compliance option for new buildings and an operating energy alternative for substantial alterations to existing buildings. The code allows flexibility for building owners and designers to pursue innovative strategies that have the potential to provide the highest return on investment. Through the code, building owners agree to a predetermined energy performance target, and provide post-construction measurement and verification to ensure that targets are achieved.²

BENCHMARKING

Non-residential and multifamily residential developments, 20,000 square feet or larger, are required to track annual energy performance and report to the city. Benchmarking is a first step towards increasing energy efficiency and lowering energy costs by showing property owners/managers how their buildings use energy. This policy supports the city's 2030 Climate Action Plan goal to reduce energy use in commercial buildings by 10% and by 20% in residential buildings.³

PRIVATE SECTOR INCENTIVES

Seattle's green building permit incentives offer expedited and facilitated permits for projects meeting stipulated green building standards. Projects certified Platinum or Gold under a LEED rating system qualify for the program.⁴

CITY EMISSIONS TARGET:

Seattle aims to reach net-zero core greenhouse gas emissions by 2050, with a 91% reduction in passenger vehicle and building energy emissions, compared with 2008 emission levels.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✓
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	630,000
Land Area (km ²)	215
Gross Domestic Product (in USD billions)	231.6
Average Walk Score ⁵	71/100
Annual Rainfall (mm/year)	965
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁶	6,041,000
% of Emissions from the Building Sector	23.57%
Municipal Emissions (metric tons CO ₂ e)	16,000

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Seattle) ⁷	4,314
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PROJECT BREAKDOWN

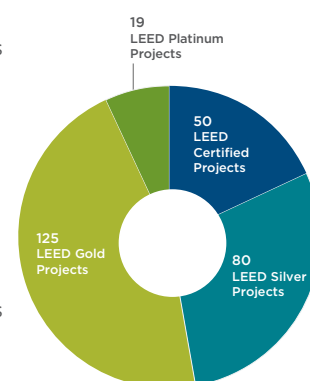


289
LEED Certified Projects
(Seattle)

305
LEED Registered
Projects (Seattle)

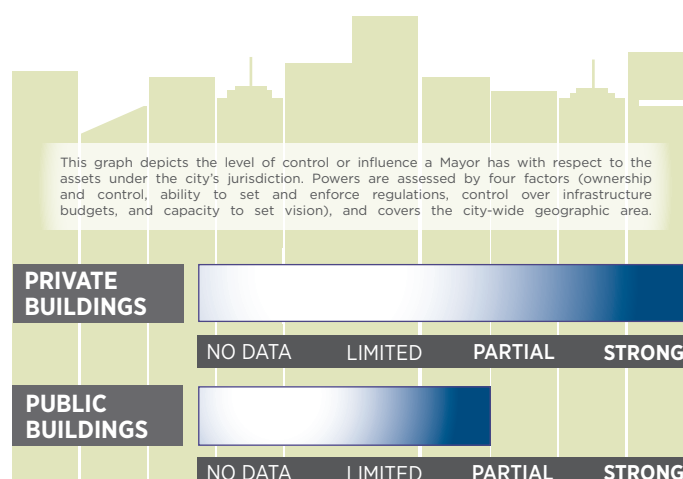
809
LEED Certified Projects
(Washington)

895
LEED Registered
Projects (Washington)



Graph depicts the distribution of LEED certified projects in Seattle

MAYORAL POWERS



POLICY SPOTLIGHT:

Seattle's Climate Action Plan, approved by City Council in June 2013, concentrates on actions that reduce greenhouse gas emissions while supporting sustainable communities, economic prosperity, and social equality. Actions are organized in two separate categories: actions to implement by 2015, and actions to implement by 2030. Specific action goals include: tripling the amount of bicycle ridership from 2007-2017, a 70% landfill diversion rate by 2022, the development of an alternative energy master plan, and increasing energy efficiency standards in the Seattle Energy Code.⁸

GREEN RESIDENTIAL BUILDINGS

The city's HomeWise program provides free weatherization services to homeowners and rental property owners that meet income qualifications. The program is intended for low-income households and apartment buildings that qualify by resident income. Weatherization retrofits can include: energy audits, installation of insulation, pipe wrapping, air sealing, weather-stripping, furnace repair and tune-up, ductless heat pumps, improved ventilation, and energy conservation-related repairs. Low interest loans are also available to homeowners for further repairs not related to energy efficiency.⁹

GREEN SCHOOLS

Seattle Public Schools (SPS) is committed to modeling environmental stewardship. In 2006, SPS adopted the Natural Resources Conservation Policy. In 2010, SPS received grants totaling \$13.04 million to be used for energy efficient improvements. Projects include:

- Energy management control installation
- HVAC systems and control replacement
- Hot water boiler replacement
- Reroofing and roof insulation installation
- Thermal pane windows installation
- Ground source heat pumps installation
- Lighting controls installation
- Lighting retrofits¹⁰

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PROJECT SPOTLIGHT:



Photo courtesy of Flickr Creative Commons user Gates Foundation

Bill and Melinda Gates Foundation Campus

The Bill and Melinda Gates Foundation Campus achieved Platinum certification under the LEED for New Construction 2.2 rating system in September 2011. The building's design resulted in a 50% reduction in potable landscape water use and a 20% reduction in baseline indoor water use, both against a modeled baseline. The campus takes part in a 35% green power purchase agreement. Half the wood used in construction was certified sustainable by the Forest Stewardship Council.¹¹

LEED Scorecard

Platinum 54/69

▶ SUSTAINABLE SITES	13 OF 14	
▶ WATER EFFICIENCY	5 OF 5	
▶ ENERGY AND ATMOSPHERE	10 OF 17	
▶ MATERIAL AND RESOURCES	7 OF 13	
▶ INDOOR ENVIRONMENTAL QUALITY	14 OF 15	
▶ INNOVATION IN DESIGN	5 OF 5	

GREEN BUILDING CITY MARKET BRIEF

TORONTO

ONTARIO



CITY-WIDE MOVEMENT

Toronto became the first city in North America to enact a bylaw requiring and governing the construction of green roofs on new developments. Adopted in May 2009, under Section 108 of the city of Toronto Act, the bylaw applies to new residential, commercial and industrial developments with a minimum gross floor area (GFA) of 2,000 square meters. The size of the green roof to be installed is dependent on the GFA of the building. For example, buildings with a GFA between 2,000-4,999 square meters must install a green roof covering 20% of available roof space, while buildings with a GFA of 20,000 square meters or more must cover 60% of available roof space with a green roof installation.¹

LEADING BY EXAMPLE

Under the city's Energy Retrofit Program, instituted in 2004, more than 200 municipally owned buildings have been retrofitted, saving Toronto more than \$4 million and reducing Co2 emissions by more than 15,000 tons. The retrofits target lighting systems, building automation systems, building envelope, pipe insulation, solar water heating systems, and equipment and system upgrades, along with waste diversion measures.

The city of Toronto provided funds for the development of an innovative deep lake water cooling system that draws water from the cold depths of Lake Ontario to provide cooling to city buildings and high rise structures within Toronto. The advanced system reduces energy consumption by up to 90%, compared with traditional chillers.²

CITY EMISSIONS TARGET:

The city of Toronto hopes to achieve a 30% reduction in carbon-dioxide emissions by 2020, compared with 1990 levels.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✗

CITY DETAILS

Population	2.62 million
Land Area (km ²)	630
Gross Domestic Product (in USD billions)	260.6
Average Walk Score ³	71/100
Annual Rainfall (mm/year)	978
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁴	20,660,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Toronto) ⁵	1,153
--	-------

PROJECT BREAKDOWN

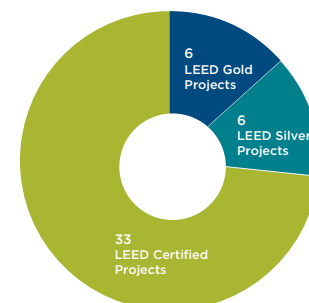


45
LEED Certified Projects
(Toronto)

32
LEED Registered
Projects(Toronto)

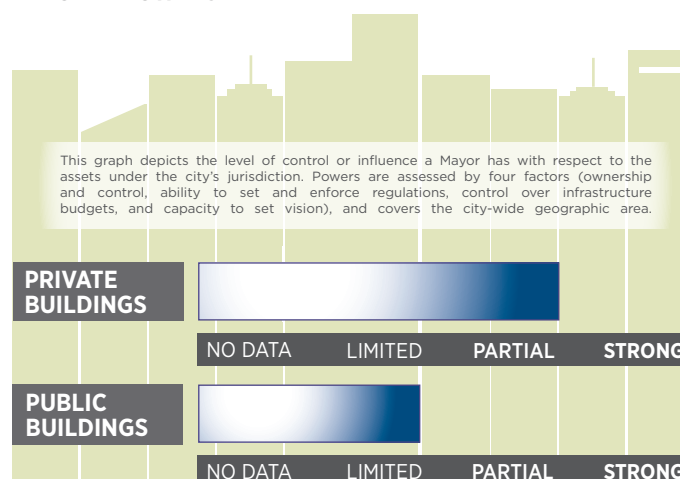
368
LEED Certified Projects
(Canada)

181
LEED Registered
Projects (Canada)



Graph depicts the distribution of LEED certified projects in Toronto

MAYORAL POWERS



POLICY SPOTLIGHT:

The Home Energy Loan Program, (HELP)⁶ and Highrise Retrofit Improvement (Hi-RIS) Program⁷, were approved by the Toronto City Council in July 2013 as a financing tool to help residents and multi-residential property owners improve home and building energy efficiency. The programs makes low interest loans available to qualifying property owners for energy and water efficiency improvements. Potential savings from efficiency upgrades are intended to help offset the cost of monthly loan repayments to the city. Through the programs, local utilities offer incentives for energy assessments and the replacement of furnaces, boilers and other improvements that yield greater energy efficiency.

GREEN CODES

The Toronto Green Standard, adopted by City Council in December 2010, is a two-tier set of performance measures, with accompanying guidelines, related to sustainable site and building design for new developments. Tier 1 of the standard requires developments to achieve a 15% energy efficiency improvement over the Ontario Building Code along with several other sustainability measures, including drought tolerant landscaping, tree planting, green and cool roofs, bicycle parking and bird friendly glazing. New planning applications are required to be in compliance with the standard's Tier 1 environmental performance measures. Tier 2 environmental performance measures are a voluntary higher-level set of environmental performance. Projects in compliance with Tier 2 of the Toronto Green Standard may be eligible for a development charge refund. Minto's 775 King St West and Daniel Corporation's 170 Sumach have recently achieved Tier 2 certification.⁸

PRIVATE SECTOR INCENTIVES

Toronto's Eco-Roof Incentive Program, launched in 2009, aims to promote the installation of green and cool roofs on the city's new and existing buildings. The program applies to existing and new residential, industrial, commercial and institutional buildings with a gross floor area of 2,000 square meters or less; and any new or existing Toronto Public and Separate School Board building of any size. Projects opting to install a green roof will receive \$75 per square meter of up to a maximum of \$100,000. Cool roofs are eligible to receive \$2 or \$5 per square meter depending on membrane replacement, up to a maximum of \$50,000.⁹

GREEN SCHOOLS

The Solar Schools Project is a Toronto District School Board initiative to install solar panels on the roofs of 311 schools starting in spring 2014. The project, when completed, will generate energy equivalent to that used by approximately 4,250 Toronto households annually. Revenue generated from the installations will be used to fund school rooftop repairs and replacements. Over the course of the initiative an estimated 4.3 million square feet of school roofs will be repaired or replaced.¹⁰

PROJECT SPOTLIGHT:

Royal Bank Plaza

Toronto's Royal Bank Plaza achieved Gold Certification under the LEED for Existing Buildings rating system in January 2010. Ongoing consumables and durable goods are reused, recycled or composted at a rate of 30%. Waste from facility alterations and additions was diverted from landfills at a rate of 50%. There was a 10% reduction in indoor potable water use and a 50% reduction in potable landscape water, both against a modeled baseline. Additionally, the building received a 79 ENERGY STAR® Performance Rating.¹¹

LEED Scorecard

Gold 51/75



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GREEN BUILDING CITY MARKET BRIEF

VANCOUVER

BRITISH
COLUMBIA

A CITY-WIDE MOVEMENT

Vancouver's Greenest City Action Plan is intended to address the city's environmental challenges through measurable and attainable targets. The plan, enacted in 2011, aims to make Vancouver the greenest city in the world by 2020. It is divided into 10 goal areas, each with a specific objective for 2020. Building specific goals include requiring all buildings constructed from 2020 onward to be carbon neutral in operations, and reducing energy use and greenhouse gas emissions in existing buildings by 20% over a 2007 baseline.¹

LEADING BY EXAMPLE

Vancouver has taken on four high-priority actions for greening city operations that will aid in meeting targets established in the Greenest City Action Plan. All new municipal facilities are required to be built to achieve LEED Gold certification. Existing facilities will also be upgraded to be more energy efficient. For example, City Hall was retrofitted with new boilers, water conserving fixtures, new lighting, and a building automation system.²

In other areas of the city's operations, Vancouver achieved a 70% average waste recycling rate for city buildings in 2013; City Hall achieved a 85% diversion rate. The city's vehicle fleet was recognized as the greenest municipal fleet in Canada, and was one of the top 20 greenest fleets in North America in 2013. City operations also surveyed fire hydrants for water leakage, saving 200 million liters of water and up to \$200,000 annually.³

MOVING BEYOND CODE

By square footage, about 65% of the new office space and multifamily developments in Vancouver pursue the rezoning process, resulting in a boost in land value. In exchange, the city asks these projects to exceed the building code. Projects have several options: they can pursue LEED Gold, including at least a 22% reduction in energy cost as compared with ASHRAE 90.1 2010,⁴ they can pursue the International Passive House Standard, or they can pursue the Living Building Challenge. Currently, a variety of projects are pursuing both Passive House and LEED Gold. Developments under four stories can also pursue EnerGuide 84. EnerGuide is the Government of Canada's energy performance rating.

CITY EMISSIONS TARGET:

The city of Vancouver hopes to achieve a 33% reduction in carbon-dioxide emissions by 2020, compared with 2007 emissions.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	600,000
Land Area (km ²)	114
Gross Domestic Product (in USD billions)	101.2
Average Walk Score ⁵	78/100
Annual Rainfall (mm/year)	1,239
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁶	2,690,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Vancouver) ⁷	908
--	-----

PROJECT BREAKDOWN

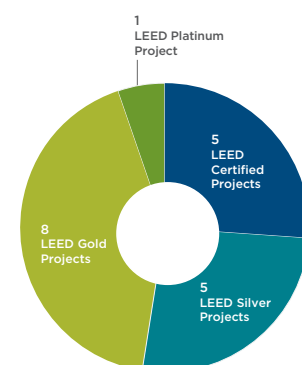


19
LEED Certified
Projects (Vancouver)

11
LEED Registered
Projects (Vancouver)

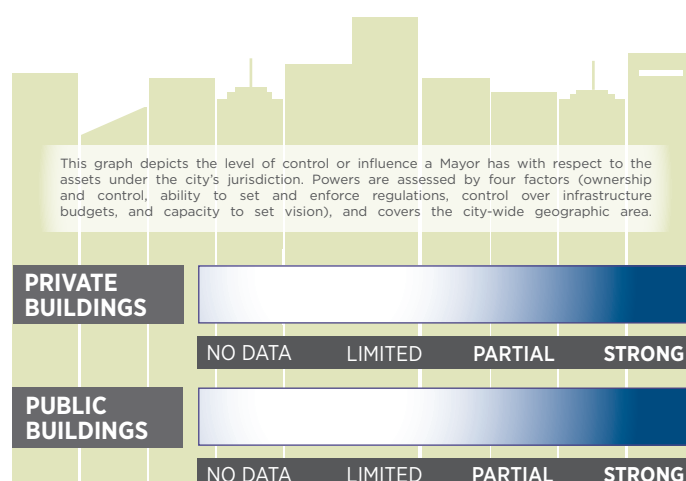
368
LEED Certified
Projects (Canada)

181
LEED Registered
Projects (Canada)



Graph depicts the distribution of LEED certified projects in Vancouver

MAYORAL POWERS



POLICY SPOTLIGHT:

Vancouver's General Policy for Higher Buildings requires the city's tallest buildings to achieve a 45% reduction in energy use compared to ASHRAE 90.1 2010.⁸ This tall buildings policy is also intended to demonstrate green building design beyond prevailing policy. The policy has already led to applications with advanced environmental design.

GREEN JOBS AND KNOWLEDGE THROUGH GREEN BUILDING

Green building design and construction jobs in Vancouver increased 50% between 2010 and 2013.⁹ Fueled in part by international demand for green building talent, much of the growth came from local demand in response to the city's progressive building policies. For instance, Vancouver leads Canada with its requirement that all 1 and 2 family homes receive air leakage testing and an EnerGuide rating, leading to lower energy use and more comfortable homes for the occupants. The EnerGuide reports help builders construct energy-efficient homes more cost-effectively, and the knowledge generated helps the city develop future building codes. The requirement increases the number of Certified Energy Advisors in the marketplace, growing local knowledge of energy efficient building practices. With increased understanding, skill, and materials come cost reductions.

DISTRICT ENERGY

Rezoned buildings in district energy zones in Vancouver must connect to a district energy system. Vancouver's Southeast False Creek Neighborhood Energy Utility (NEU) is a permanent district energy system that harvests heat from the sewer main to heat thousands of homes. At latest count, the NEU provides energy for heat and hot water for approximately 3.5 million square feet of building space. Also, Vancouver's large-site rezoning policy requires a range of additional planning and studies for sites two acres and over, including a district energy screening and feasibility study.¹⁰

SUSTAINABLE COMMUNITIES

To help the city reach its 2020 goal of reducing solid waste going to landfills or incinerators by 50% (compared with 2008 levels), Vancouver expanded its Green Bin Program to include single-family homes and duplexes. Green bins can be filled with food scraps, food soiled paper, and landscape trimmings. The bins are collected weekly by automated city trucks. At latest count, an unprecedented 39,000 tons of green bin waste was diverted to composting, the amount of garbage produced by single-family homes dropped by approximately 40%, and 12% less waste is going to landfill or incinerator.¹¹

GREEN SCHOOLS

In 2010, the Vancouver School Board set a 5 year target for energy intensity and carbon emissions reductions. Targets include a 15% reduction in electricity consumption, a 5% cut in natural gas consumption, and a total energy consumption reduction of 8%, relative to 2008-2009 levels. To help reach this goal the school board has implemented staff trainings regarding energy savings, upgrades to lighting and heating plants, computer energy saving measures, and a shutdown checklist to help minimize energy waste during school break periods.¹²

PROJECT SPOTLIGHT:

MEC Head Office

The rezoned and recently completed head office for Mountain Equipment Co-op (MEC) is designed to use 70% less energy than a typical structure, and is expected to achieve a LEED Platinum rating. The 110,000+ square foot facility will also use rainwater for approximately 80% of its non-drinking needs, and showers for bike-commuting employees are equipped with drain-water heat recovery to reduce heating load. To help foster alternative modes of transport, the building has enough bike storage for 35% of employees, and is situated next to a light-rail station.

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GREEN BUILDING CITY MARKET BRIEF

WASHINGTON

DISTRICT OF
COLUMBIA

CITY-WIDE MOVEMENT

Washington, DC, ranks number one in both LEED and ENERGY STAR® certified buildings per capita in the U.S. and has an impressive and progressive history of green building policy deployment. DC was the first major city in the U.S. to pass laws requiring green building certification and energy and water benchmarking for both public and private buildings. On March 28, 2014, the District became the first major city to adopt all of the chapters and Appendix A of the International Green Construction Code. The adoption of this code marks a major step toward achieving the goals established in the Sustainable DC Plan, including a reduction in city-wide greenhouse gas emissions by 50% by the year 2032.

- Under the green code, commercial projects 10,000 square feet or larger, and residential projects both 10,000 square feet and larger and 4-stories or higher, must comply with the DC Green Construction Code, ICC700, ASHRAE 189.1, or be certified under LEED or Enterprise Green Communities.¹
- All public buildings of 10,000 square feet and larger and private buildings 50,000 square feet and larger must be benchmarked using the ENERGY STAR® Portfolio Manager tool.

LEADING BY EXAMPLE

Build Smart DC is a data platform that offers DC residents data on energy use in city buildings. The platform enables greater accountability of government spending and performance, and more information sharing among agencies and energy efficiency implementers. The website provides 15-minute interval energy usage data for the majority of buildings in the DC Department of General Services (DGS) portfolio.² DGS has also committed to the Better Buildings Challenge by working to reduce energy consumption in public buildings by 20% by 2020. Finally DGS is in the process of procuring more than 10MW of solar power and more than 45MW of wind power.³

CITY EMISSIONS TARGET:

In February 2013, the Mayor announced adoption of the Sustainable DC Plan with the aim of making the District the healthiest, greenest, and most livable city in the nation over the next 20 years. The plan contains specific measurable targets across 12 topics that the city hopes to achieve which together will allow the District to reduce emissions 50% below 2006 levels by 2032 and 80% by 2050. Additionally, the District plans to cut citywide energy use 50% by 2032.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✓
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	646,449
Land Area (km ²)	177
Gross Domestic Product (in USD billions)	415.2
Average Walk Score ⁴	74/100
Annual Rainfall (mm/year)	1,007
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁵	8,931,663
% of Emissions from the Building Sector	75%
Municipal Emissions (metric tons CO ₂ e)	527,811
% of Municipal Emissions from Facilities	56%

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Washington D.C.) ⁶	3,816
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PROJECT BREAKDOWN

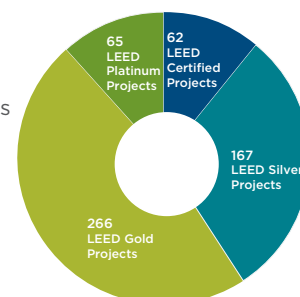


560
LEED Certified Projects
(Washington D.C.)

832
LEED Registered Projects
(Washington D.C.)

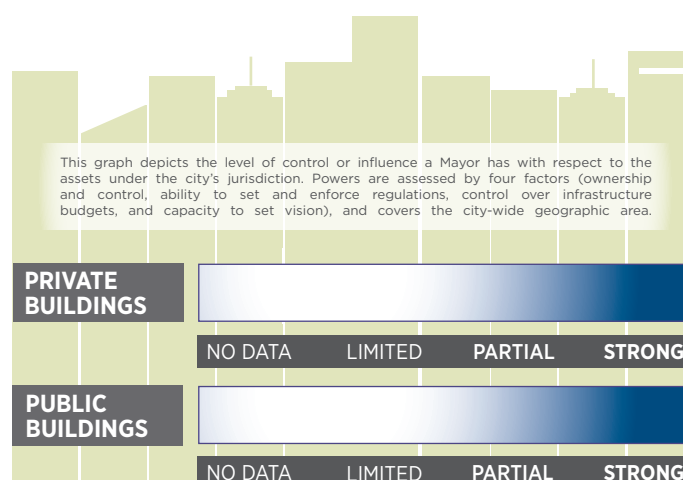
21,682
LEED Certified Projects
(United States)

30,514
LEED Registered
Projects (United States)



Graph depicts the distribution of LEED certified projects in Washington D.C.

MAYORAL POWERS



POLICY SPOTLIGHT:

DC has a long history of progressive and ground-breaking legislation:

- 2006: DC was the first major city in the U.S. to pass a law requiring green building certification
- 2008 – DC was the first city to require energy and water benchmarking for both public and private buildings
- 2010 – DC established a PACE energy and water financing program
- 2011 – DC expanded its renewable portfolio standard (20% renewables by 2023, with a 2.5% carve out for onsite solar)
- 2013 – Community Solar Act – set up virtual net metering options
- 2013 – DC created some of the strongest stormwater regulations in the country
- 2013 – DC became the 2nd city in U.S. to pass a green area ratio
- 2014 – DC passed one of the strongest Green Construction Codes

BENCHMARKING

The Clean and Affordable Energy Act of 2008 established that all private commercial and multifamily buildings 50,000 gross square feet and larger within the District of Columbia must annually measure and disclose their energy and water consumption to the District Department of the Environment (DDOE). The final regulations were published in January 2013 and the first reporting deadline was April 1, 2013. Beginning with the second year of reported data, DDOE has published summary results for each building on its website. The standard software for benchmarking and reporting is the U.S. EPA's free, industry-standard ENERGY STAR® Portfolio Manager tool. The act also requires that the energy and water use of all District government buildings 10,000 gross square feet and larger are benchmarked and disclosed.⁷

PRIVATE SECTOR INCENTIVES

The Clean and Affordable Energy Act also created the DC Sustainable Energy Utility (DC SEU). The DC SEU helps residents and businesses use less energy and save money. Since 2011, the DCSEU has delivered financial incentives, technical assistance, and information to tens of thousands of District residents and businesses, helping them to save millions of dollars on their energy costs.⁸

GREEN SCHOOLS

The DC Green Schools Challenge aims to increase sustainability in the city's public school system. The first phase of the program, launched in 2014, focuses on energy efficiency and features two powerful energy saving initiatives: the Sprint to Savings and the Innovation Challenge. Sprint to Savings is a three week competition where schools compete against one another to reduce electricity consumption. The Innovation Challenge is a program engaging student groups to conceive of, research, and design energy efficiency projects to compete for grant funding.⁹

GREEN AFFORDABLE HOUSING

Greening the District of Columbia's approximately 300,000 residential units represents an opportunity for a more sustainable DC. In 2010, approximately 20% of District residents paid more than 50% of their income for housing costs, with the greatest burden falling on those residents with incomes below 30% of the area's median.¹⁰ In order to increase housing affordability, the District has expressed a vested interest in increasing the supply of affordable housing and ensuring that new and existing homes are built to the highest standards of sustainability and utility efficiency. District government agencies, developers, community-based organizations and other partners are working together to achieve these goals through a variety of initiatives:

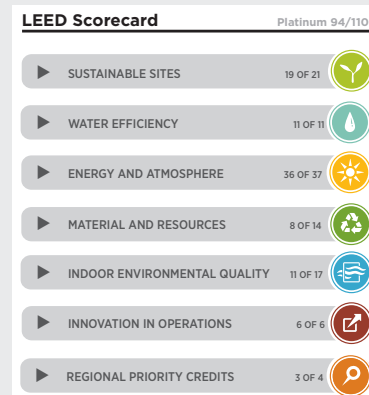
- **Providing affordable, transit-oriented, housing with an emphasis on deep sustainability.** The DC Housing Authority (DCHA) partnered with a developer to build the award-winning LEED-Platinum Sheridan Station project, which provides 327 units of mixed-income rental apartments and for-sale condominiums. Its rooftop has the largest privately-owned solar array in the city.

- **Identifying opportunities for greater efficiency and renewable energy.** DCHA has also invested in energy-efficiency measures at many of its properties, which have resulted in annual savings of \$3.9 million since completion in 2010. DCHA is now examining the feasibility of making its entire portfolio achieve net-zero energy standards per the related Sustainable DC goal. DCHA has completed a feasibility study for the Langston Dwellings in Northeast DC that suggests the site has the potential to reach net-positive energy through on-site renewables and has the potential capacity to power up to 15% of DCHA's entire portfolio.
- **Creating and preserving more green and affordable housing.** In 2011, the city set a goal to preserve or create more than 10,000 units of affordable housing by 2020. In October 2014, Mayor Vincent C. Gray announced that the District would exceed this goal.¹¹ Nearly 12,000 units of affordable housing are expected to complete construction by 2020. In compliance with the Green Building Act of 2006, the majority of these projects will be required to meet the Enterprise Green Communities standard.

PROJECT SPOTLIGHT:

USGBC Headquarters

The U.S. Green Building Council (USGBC) is the authority on LEED certification. USGBC's D.C. headquarters achieved LEED Platinum Certification under the LEED for Commercial Interiors rating system in July 2009—the highest rating a building can achieve. The building features a 75,000-square-foot workspace featuring a two-story waterfall that helps with the indoor climate control in the building. The smart energy system provides feedback on the building's energy usage in real time. The design reduces water use by 40% and energy use by 50% compared to a typical office.¹¹



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CENTRAL AND SOUTH AMERICA

- ▶ BOGOTA
- ▶ BUENOS AIRES
- ▶ CURITIBA
- ▶ LIMA
- ▶ MEXICO CITY
- ▶ RIO DE JANEIRO
- ▶ SANTIAGO
- ▶ SAO PAULO

- ▶ NORTH AMERICA
- ▶ CENTRAL & SOUTH AMERICA
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GREEN BUILDING CITY MARKET BRIEF

BOGOTÁ

COLOMBIA



A CITY-WIDE MOVEMENT

Bogotá is a leader in the green building movement, through policies that promote energy efficiency and sustainability.

LEADERSHIP BY EXAMPLE

Bogotá Basura Cero (zero waste) is a public program that aims to achieve a 100% recycling rate for all solids produced in the city by combining various waste disposal measures, including the use of bioreactors, composting, fuel generation, generation of biomass, diversion of construction waste, creation of a pre-classification plant and the optimization of an existing biogas plant. Plans are in place to promote cleaner production across various industries. Education campaigns aimed at students and the general public will address waste separation from the source. Additionally, waste tariffs will be introduced as an enforcement mechanism for those who do not separate at the source.¹

SUSTAINABLE URBAN PLANNING

Bogotá is currently developing a Sustainable Urban Planning and Buildings Policy. It seeks to promote best practices within the city at both the commercial and private building scales, including through research, institutional capacity and community engagement. The policy will include an incentives package to encourage sustainable urban regeneration projects, social inclusion and environmental balance.

SUSTAINABLE COMMUNITIES

Bogotá has a vast network of bicycle paths, or “CicloRutas,” covering over 329 kilometers and providing citizens with cycling access to numerous destinations, including many bus stops. The Ciclovía takes place each Sunday in Bogotá, during which, over 120 kilometers of the city’s roadways are closed to motorists for 7 hours to encourage walking and cycling. During Ciclovía, the city provides free entertainment.

CITY EMISSIONS TARGET:

Bogotá aims to reduce its greenhouse gas emissions by 16% below 2007 levels by 2019.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	X
Energy Benchmarking and Data Transparency	X
Green Municipal Buildings	X
New/Existing Commercial Building Incentives	X
New/Existing Residential Building Incentives	X
Green Schools	X
Neighborhood-Scale Sustainability	X

CITY DETAILS

Population	7.2 Million
Land Area (km ²)	414
Gross Domestic Product (in USD billions) ²	140.3
Average Walk Score ³	95/100
Annual Rainfall (mm/year)	731.44
Climate Action Plan	Pending

BUILDING PERFORMANCE

EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁴	16,279,278
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

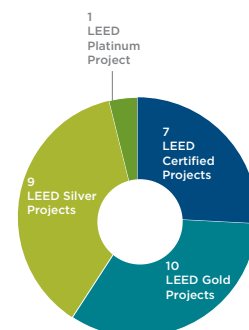
GREEN BUILDING PROFESSIONALS

LEED Credentialed Professionals (Colombia) ⁵	147
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PROJECT BREAKDOWN

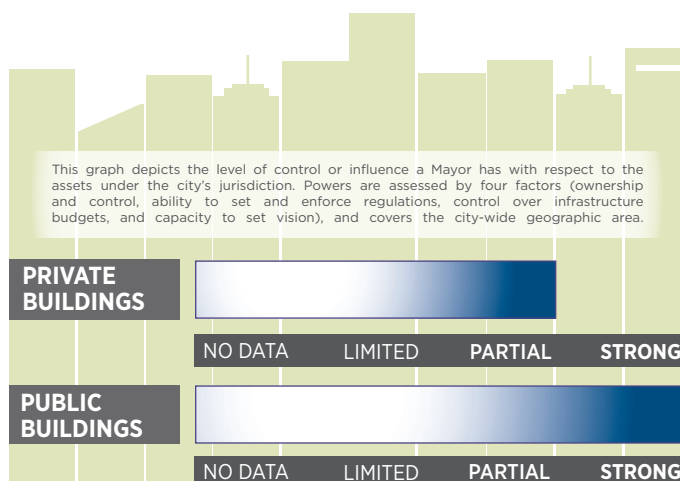


- 46 LEED Certified Projects (Colombia)
- 144 LEED Registered Projects (Colombia)
- 27 LEED Certified Projects (Bogotá)
- 51 LEED Registered Projects (Bogotá)



Graph depicts the distribution of LEED certified projects in Bogotá

MAYORAL POWERS

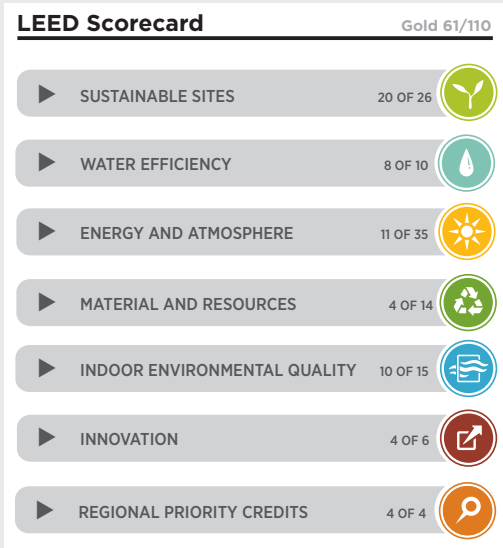


Bogotá's Transmilenio system is highly efficient in its own right, serving over 2.2 million passengers daily. To encourage use of the system, the government discourages the use of cars twice a week during rush hour. In 2000, citizens voted to ban the use of cars each year on the second Thursday of February, and to promote sustainable means of transportation. The day has become known as 'car-free day' and infrastructure has been expanded to include multiple lanes for local and express buses.⁶

PROJECT SPOTLIGHT:

Aloft Hotel Bogotá Airport

The Aloft Hotel Bogotá Airport, a Starwood hotel is the first hotel in Colombia to receive LEED certification and the first in Latin America to achieve LEED Gold certification. Aloft Hotel Bogotá Airport reduced its energy consumption by 30% and achieved an energy savings of 24%. Over 800 square meters of green roofs were installed at the project and 38% of the materials used in the project were produced within a 500 mile radius of the construction site. 75% of the spaces have optimal levels of daylighting, enhancing the occupant experience of guests and staff.⁷



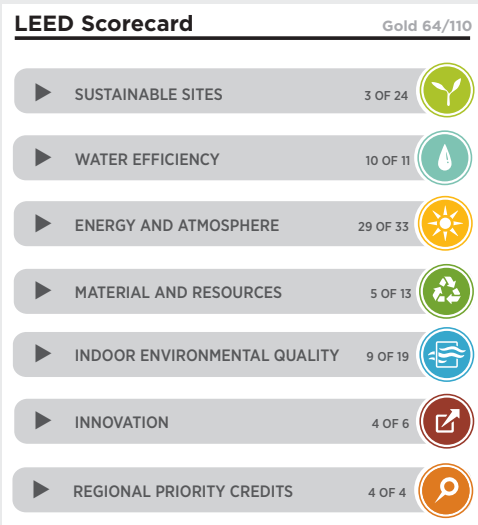
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PROJECT SPOTLIGHT:

Rochester School

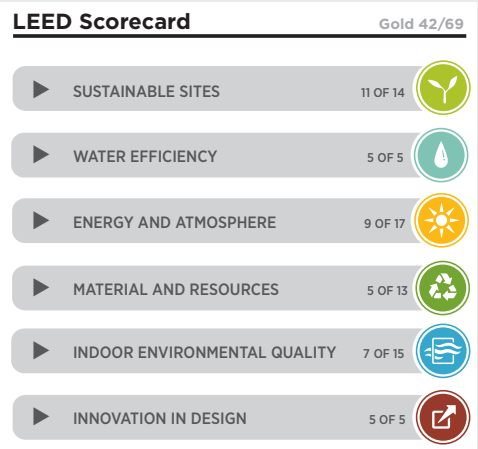
The Rochester School achieved LEED Gold Certification under the LEED Schools 2009 Rating System in January 2010. The school is located in a natural forest area on the outskirts of Bogotá, and serves students from pre-school through high school. The school has reduced potable water consumption by 35% through an on-site wastewater treatment plant.⁸



PROJECT SPOTLIGHT:

GNB Sudameris

GNB Sudameris achieved LEED Gold Certification under the LEED for New Construction 2.2 Rating System in June 2013. The building's design resulted in a 20% reduction in baseline indoor water use, a 50% reduction in potable landscape water use and a 31.5% energy improvement upon a modeled baseline building performance rating.⁹



GREEN BUILDING CITY MARKET BRIEF

BUENOS AIRES

ARGENTINA



A CITY-WIDE MOVEMENT

In September 2011, the City of Buenos Aires passed the Climate Change Act, which demonstrated the government's commitment to addressing this important issue. To effectively address climate mitigation and adaptation, the city government aimed to use energy more efficiently, incorporate renewable energy sources, introduce efficient street lighting technologies, promote sustainable design and construction practices, transform the efficiency of the transportation sector and manage waste more sustainably.

The City of Buenos Aires plans to reduce energy use in public buildings by 20% by 2015.

Currently the government is developing a legal framework for the introduction and promotion of sustainability strategies, including the installation of green roofs, compliance with minimum values of thermal insulation and storage of rainwater. Additionally, the city hosts public databases where information is available regarding building inspectors, environmental regulations, e-waste collection, green companies, notices of green products, ratings of products energy efficiency and city air quality.

LEADERSHIP BY EXAMPLE

In 2008, the Environmental Protection Agency launched the Energy Efficiency Program in Public Buildings, with the goal of analyzing and monitoring the energy consumption patterns from five different public buildings types in order to promote energy efficiency improvements. The program requires the implementation of a number of measures with the aim to reduce electricity and heating bills, including the development of energy management tools, employment of energy audits, and improvement of a building's operation and maintenance procedures. Currently, approximately 20 buildings have undergone an energy audit and are implementing recommended efficiency improvements. Additionally, new public buildings are required to meet certain environmental sustainability criteria.¹

CITY EMISSIONS TARGET:

The City of Buenos Aires aims to reduce greenhouse gas emissions by 30% below 2008 levels by 2030, with a midterm goal of 5% reductions by 2015.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	X
Energy Benchmarking and Data Transparency	X
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	X
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	X

CITY DETAILS

Population	2.89 Million
Land Area (km ²)	203
Gross Domestic Product (in USD billions) ²	348.4
Average Walk Score ³	98/100
Annual Rainfall (mm/year)	1,186
Climate Action Plan	Yes

BUILDING PERFORMANCE

EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁴	11,157,087
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--
Municipal Emissions from the Building Sector	482,417

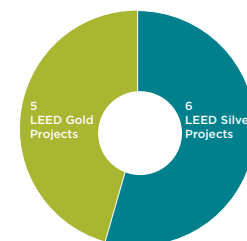
GREEN BUILDING PROFESSIONALS

LEED Credentialed Professionals (Argentina) ⁵	63
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PROJECT BREAKDOWN

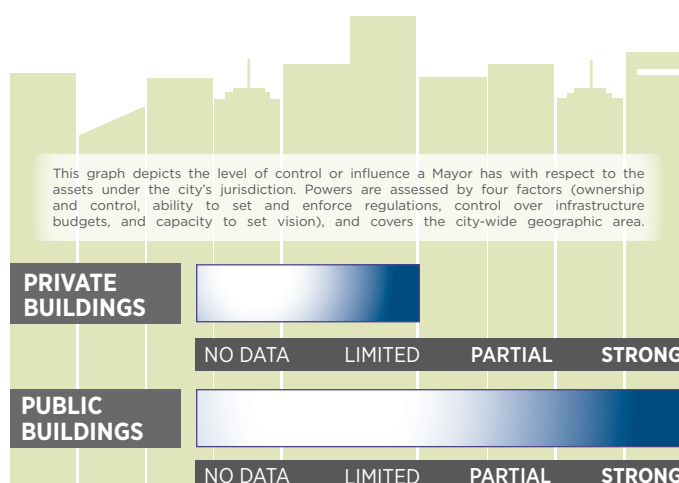


24	LEED Certified Projects (Argentina)
101	LEED Registered Projects (Argentina)
11	LEED Certified Projects (Buenos Aires)
49	LEED Registered Projects (Buenos Aires)



Graph depicts the distribution of LEED certified projects in Buenos Aires

MAYORAL POWERS



POLICY SPOTLIGHT:

In 2009, the City of Buenos Aires issued the Buenos Aires 2030 Climate Change Action Plan, to support the city's mitigation and adaptation goals between 2010 and 2030. The plan involves actions at all levels within the city, including many that will be undertaken by the government in its municipal sectors including building, energy, transportation and waste.⁶

GREEN RESIDENTIAL BUILDINGS

The city government has installed solar collectors in multi-family households and a community center located in two low-income neighborhoods.

GREEN SCHOOLS

In 2010, the City of Buenos Aires introduced the Green Schools Program with the aim of promoting sustainable development through environmental education and management in schools. The program considers students as change agents capable of replicating the knowledge acquired on environmental stewardship, including waste management, environmental health, energy efficiency, renewable energy and climate change.

SUSTAINABLE COMMUNITIES

In 2011, Buenos Aires developed the Plan for Sustainable Mobility, which created the first bus rapid transit system in Argentina as well as the extension of the existing metro system. The plan also included the widening of sidewalks and pedestrian footpaths. Another initiative, EcoBici, established Argentina's first bike-sharing program, which has grown exponentially since its inception.⁷

PROJECT SPOTLIGHT:

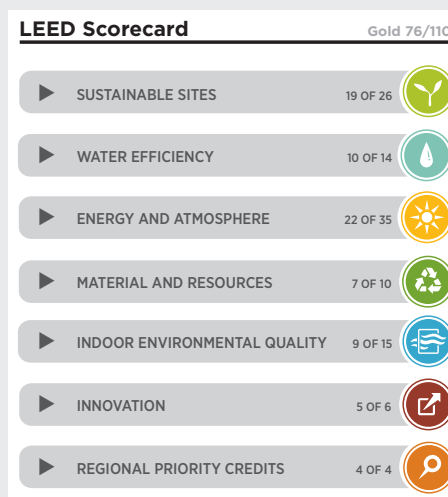
Nike Store, Buenos Aires

The store received LEED Gold certification under the LEED for Commercial Interiors Rating System. It is the first store in Argentina to receive a Gold certification under this system. Energy efficient appliances reduce consumption by 80% and plumbing alterations have reduced water use by 40%. 90% of waste generated in the store is recycled locally, and as much as 94% of waste is diverted from landfills; these materials are either reused or donated. All of the new wood used in the project is certified sustainable by the Forest Stewardship Council.⁸

PROJECT SPOTLIGHT:

HSBC Barrancas de Lezama

In 2011, HSBC's Argentine Headquarters received LEED Gold certification under the LEED for Existing Buildings: Operations and Maintenance Rating System. The 51,000 square foot centennial building accommodates 2,300 employees and was the first LEED EB certified building in South America. Sustainability achievements include a more than 75% reduction in individual car use, the installation of a green roof, 100% achievement rate for rainwater use in irrigation and a 92 Energy Star performance rating.⁹



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GREEN BUILDING CITY MARKET BRIEF

CURITIBA **BRAZIL****A NATIONAL MOVEMENT**

The Minha Casa Minha Vida Program (MCMVP) is a national housing provision program that aims to increase access to housing for low-income families by enabling the production and acquisition of new housing units, while stimulating economic growth through investments in the construction sector. The program was launched by the Brazilian Federal Government in 2009 and has contracted over 3.4 million housing units, of which 1.7 million have already been delivered to the beneficiary families. The goal is to contract another 250,000 units before December 2014. The program is managed by the Brazilian Ministry of Cities and implemented by two federal banks, CAIXA Economica Federal and Banco do Brasil. Also included in MCMVP, is a systems of grants intended to cover the cost of solar water heating systems. Furthermore, the program allows for public buildings to be retrofitted in order to serve as housing developments for low-income families.

Presidential Executive Order 7.746/2012, signed in 2012, made it mandatory for public administrators to consider sustainability when awarding contracts. Bids for government contracts must specify the use of materials that are non-toxic and biodegradable. Additionally, on the federal level, green building certifications, including LEED, can be used as tools to guide administrators' decisions.¹

LEADING BY EXAMPLE

Curitiba's Master Plan earned the city a Globe Sustainable City Award in 2010. The plan integrates urban development with transportation infrastructure and land use planning. It limits urban sprawl and facilitates development along transportation axes. The maximum allowable density of a particular area within the city is directly related to the availability of public transportation. Though Curitiba's population has double since the 1970's, automobile traffic has decreased by 30%.²

In 2013, Curitiba's City Council adopted Decree no. 1668, which mandates sustainable development as a priority in purchasing and the process for awarding contracts. Article 9 of the decree includes green building norms such as energy and water efficiency.

NATIONAL EMISSIONS TARGET:

Brazil has pledged to reduce its emissions by 36.1% to 38.9% by 2020, compared to business-as-usual levels.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	X
Energy Benchmarking and Data Transparency	X
Green Municipal Buildings	X
New/Existing Commercial Building Incentives	X
New/Existing Residential Building Incentives	X
Green Schools	X
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	1.8 million
Land Area (km ²)	432
Gross Domestic Product (in USD billions)	--
Average Walk Score ³	98/100
Annual Rainfall (mm/year)	1,408
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

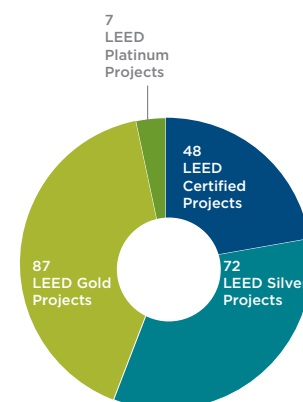
City-wide Emissions (metric tons CO ₂ e)	--
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

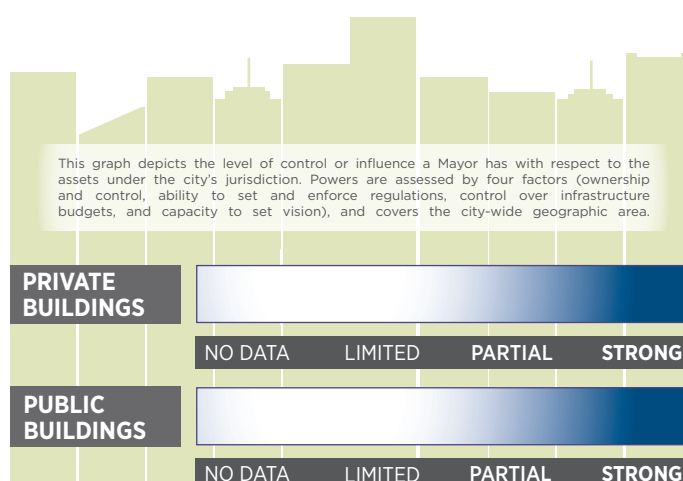
LEED Credentialed Professionals (Brazil) ⁴	252
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PROJECT BREAKDOWN

214 LEED Certified Projects (Brazil)
722 LEED Registered Projects (Brazil)
9 LEED Certified Projects (Curitiba)
25 LEED Registered Projects (Curitiba)



Graph depicts the distribution of LEED certified projects in Brazil

MAYORAL POWERS

SUSTAINABLE COMMUNITIES

In the 1990's, the city of Curitiba instituted a "green exchange" program, through which participating low-income urban residents were given food or bus tickets in return for properly disposed household waste at neighborhood collection centers. This innovative program was an important approach to waste management in settlements that cannot be served by waste collection vehicles. The city's paper recycling efforts save the equivalent of 1,200 trees daily. Revenue generated by the sale of recycled materials is used to fund social programs such as Open University, which allows residents to take vocational courses either at no cost or at a subsidized rate.⁵

In 1974, Curitiba developed the world's first bus rapid transit system, Rede Integrada de Transporte. When it was first installed, the system served 25,000 people daily. Today, it now serves more than 2 million citizens every day.

GREEN SCHOOLS

In schools throughout Curitiba, students are taught how to properly separate their waste. The children can then recycle their waste in exchange for school supplies, toys, and movie tickets.

The city has had an urban development master plan since 1968 and boasts 52 square meters of green space per capita.

PROJECT SPOTLIGHT:

Mariano Torres 729 Corporate

The Mariano Torres 729 Corporate project achieved LEED Gold Certification under the LEED Core and Shell Rating System in April 2013. The building is conveniently located with access to basic services and public transportation in close proximity. Both the front façade and roof are vegetated to aid stormwater management efforts and no potable water is used for irrigation. Additionally, 90% of occupied spaces have quality views.⁶

LEED Scorecard

Gold

▶ SUSTAINABLE SITES	20 OF 28	
▶ WATER EFFICIENCY	10 OF 10	
▶ ENERGY AND ATMOSPHERE	17 OF 37	
▶ MATERIAL AND RESOURCES	5 OF 13	
▶ INDOOR ENVIRONMENTAL QUALITY	5 OF 12	
▶ INNOVATION	3 OF 6	
▶ REGIONAL PRIORITY CREDITS	4 OF 4	

PROJECT SPOTLIGHT:



Photograph Courtesy of Flickr Creative Commons User juulees

Colegio Positivo Internacional

Colegio Positivo Internacional was certified Gold under LEED for Schools 2009 in June 2014.⁷

LEED Scorecard

Gold 61/110

▶ SUSTAINABLE SITES	12 OF 24	
▶ WATER EFFICIENCY	10 OF 11	
▶ ENERGY AND ATMOSPHERE	19 OF 33	
▶ MATERIAL AND RESOURCES	5 OF 13	
▶ INDOOR ENVIRONMENTAL QUALITY	7 OF 11	
▶ INNOVATION	5 OF 6	
▶ REGIONAL PRIORITY CREDITS	4 OF 4	

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GREEN BUILDING CITY MARKET BRIEF

LIMA

PERU



A NATIONAL MOVEMENT

Peru's commitment to sustainability in the built environment is demonstrated through its steadfast development of a national Green Building Code. This code is being developed through a committee of diverse stakeholders, including representatives from the public and private sectors. This document is currently under review by the Peru Ministry of Housing and, when adopted, will impose voluntary criteria for compliance. In the meantime, green building certification requirements and incentives are under development with the support of the World Bank and will contribute to a "National Plan for Sustainable Building."¹

According to Peru's National Energy Balance in 2010, residential, commercial and public buildings account for 45% of the nation's total electricity consumption.

SUSTAINABLE COMMUNITIES

Lima's Integrated Transport System, implemented with financial support from the Global Environment Facility, includes the adoption of a standard, more efficient bus for public transit; rearrangement of the city's principal highways to manage traffic, reduce travel times and, consequently, reduce fuel consumption and emissions; and development of urban transport regulation. Some notable program achievements include a 3.6% increase in bicycle trips in Lima between 2004 and 2010, the rehabilitation of 33.2 kilometers of bikeway and construction of 19.4 kilometers of bikeway between 2004 and 2010, and the decommissioning of 790 old, inefficient buses, corresponding to an annual reduction in approximately 26,500 tons of CO₂ emissions.²

The Metropolitan Urban Development Plan for Lima and Callao (PLAM) outlines the municipality's vision toward a more competitive future by 2035. PLAM includes guidance for achieving environmental balance and efficiency with appropriate risk management. Urban mobility and densification are priorities under PLAM 2035. Densification of the city seeks to curb urban sprawl and maximize the efficiency of municipal functions, such as garbage collection and sidewalks, and increase access to basic services, such as street lighting, water and proper stormwater management.³

Lima produces 15,432,105 tons of CO₂e, which accounts for approximately 12% of the country's emissions.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✓
Green Municipal Buildings	✗
New/Existing Commercial Building Incentives	✗
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	8.76 Million
Land Area (km ²)	2,672
Gross Domestic Product (in USD billions) ⁴	177.4
Average Walk Score ⁵	82/100
Annual Rainfall (mm/year)	9
Climate Action Plan	Pending

BUILDING PERFORMANCE

EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁶	15,430,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

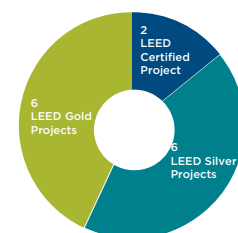
GREEN BUILDING PROFESSIONALS

LEED Credentialed Professionals (Peru) ⁷	53
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PROJECT BREAKDOWN

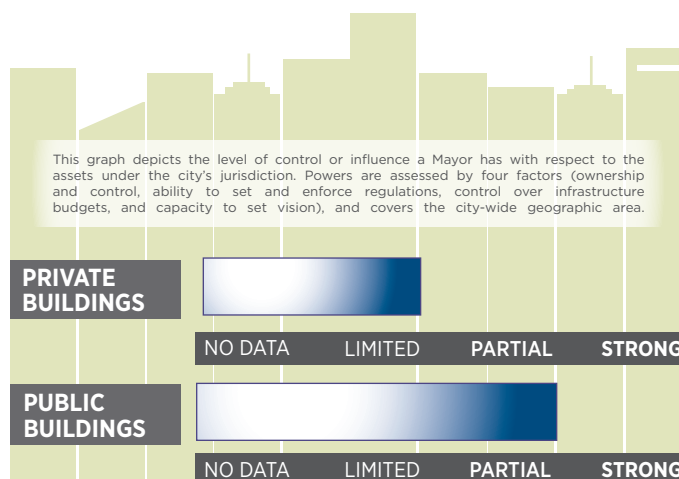


14	LEED Certified Projects (Peru)
109	LEED Registered Projects (Peru)
11	LEED Certified Projects (Lima)
84	LEED Registered Projects (Lima)



Graph depicts the distribution of LEED certified projects in Peru

MAYORAL POWERS



POLICY SPOTLIGHT:

On 14 March 2012, Peru's Ministry of Environment and Ministry of Mines and Energy partnered with the Global Environment Facility on a Nationally Appropriate Mitigation Action (NAMA) that would result in zero net emissions in land use, land use change and forestry (LULUCF) through sustainable building practices by 2021, the bicentennial anniversary of Peru's Independence.⁸

The expected products of the cooperation agreement between the International Finance Corporation and the Ministry of Housing, Ministry of Environment, Peruvian Building Chamber and Peru Green Building Council, include:

- Development of a construction baseline and 15-year targets;
- Analysis of energy and water efficiency according to building type, climate zone and socioeconomic status;
- Analysis of the cost of green buildings;
- Analysis of potential economic incentives, including financial awards and tax credits;
- Development of regulations by building type and sector;
- Development of a tool for the measurement and verification of energy and water reductions below a baseline; and
- Promotion of project initiatives and progress.

URBAN GREEN SPACE

The City of Lima seeks to protect and conserve natural ecosystems in order to provide safe and healthy public spaces for the community. This effort involves remodeling and building new parks, which to-date has provided the city with 90 hectares of new green areas. The City declared the "Lomas de Lima," or coastal hills, a regional conservation area, protecting a unique natural ecosystem of over 10,700 hectares. Additionally, urban agriculture is promoted throughout the city by the creation of 1,000 orchards, with more than 23,000 urban farmers trained.

The City practices responsible irrigation in its parks and open spaces, including through the reuse of treated wastewater in 5 parks. The combined total of 1,308 cubic meters of treated wastewater produced each day irrigates 535,061 square meters of green areas. There are four treatment plants in operation, processing 709 cubic meters of treated wastewater each day, for the irrigation of 12 hectares of green areas in road interchanges.⁹

GREEN SCHOOLS

There are 30 public schools in Lima, serving more than 18,000 students. Each school has formed an environmental committee and plans to improve campus sustainability. Two of the four components have already been developed, including the implementation of 120 recycling modules and creation of over 5,600 square meters of green areas. The energy and water efficiency components are still under development.¹⁰

PROJECT SPOTLIGHT:

Platinum Plaza Building

Lima's Platinum Plaza Building achieved LEED Gold Certification under LEED Core & Shell 2.0 in November 2011. Half of the wood used to construct the 265,210 square foot office building was certified by the Forest Stewardship Council, and the building's design resulted in a 50% reduction in wastewater. There was also a 21% improvement on baseline building performance rating and nine out of ten occupants enjoy quality views.¹¹

LEED Scorecard

Gold 36/61



SUSTAINABLE SITES

11 OF 15



WATER EFFICIENCY

4 OF 5



ENERGY AND ATMOSPHERE

6 OF 14



MATERIAL AND RESOURCES

5 OF 11



INDOOR ENVIRONMENTAL QUALITY

6 OF 11



INNOVATION IN DESIGN

4 OF 5



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GREEN BUILDING CITY MARKET BRIEF

MEXICO CITY

MEXICO



A CITY-WIDE MOVEMENT

In 2008, Mexico City initiated a Climate Action Plan with the immediate goal to reduce the city's CO₂ emissions by 12% within four years. This goal complements the city's overall emissions reduction target of 50% below 2000 levels by 2050. 26 initiatives, focused on energy and water efficiency, transportation, waste management and reforestation, support the goals of the Climate Action Plan.¹

LEADING BY EXAMPLE

Mexico City's government is investing in green roofs on public buildings to help absorb air pollution within the city. More than 236,000 square feet of green roofs are speckled throughout the Federal District, and can be found on hospitals, schools and municipal buildings. The government is expected to increase funding in order to install more.²

In 2008, Mexico City set a goal to reduce greenhouse gas emissions by 7.7 million tons below current levels by 2012.

PRIVATE-SECTOR INCENTIVES

The Mexico City government, through the creation of local environmental standard NADF-013-RNAT-2007, established the technical specifications for green roof systems within the city. Both new and existing residential buildings are eligible to receive a 10% reduction in their property housing taxes for installing an approved green roof.³

GREEN RESIDENTIAL BUILDINGS

The Sustainable Housing Program under Mexico City's Climate Action Plan, which targets both new and existing multifamily buildings, promotes the inclusion of green building features such as solar photovoltaic panels, energy efficiency, water efficiency and wastewater treatment facilities.⁴

CITY EMISSIONS TARGET:

Mexico City aims to reduce its greenhouse gas emissions by 50% below 2000 levels by 2050.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	X
Energy Benchmarking and Data Transparency	X
Green Municipal Buildings	X
New/Existing Commercial Building Incentives	X
New/Existing Residential Building Incentives	✓
Green Schools	X
Neighborhood-Scale Sustainability	X

CITY DETAILS

Population	8,851 Million
Land Area (km ²)	1,485
Gross Domestic Product (in USD billions) ⁵	441.4
Average Walk Score ⁶	78/100
Annual Rainfall (mm/year)	820
Climate Action Plan	Yes

BUILDING PERFORMANCE

EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁷	26,230,000
% of Emissions from the Building Sector	46%
Municipal Emissions (metric tons CO ₂ e)	--

GREEN BUILDING PROFESSIONALS

LEED Credentialed Professionals (Mexico) ⁸	399
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PROJECT BREAKDOWN

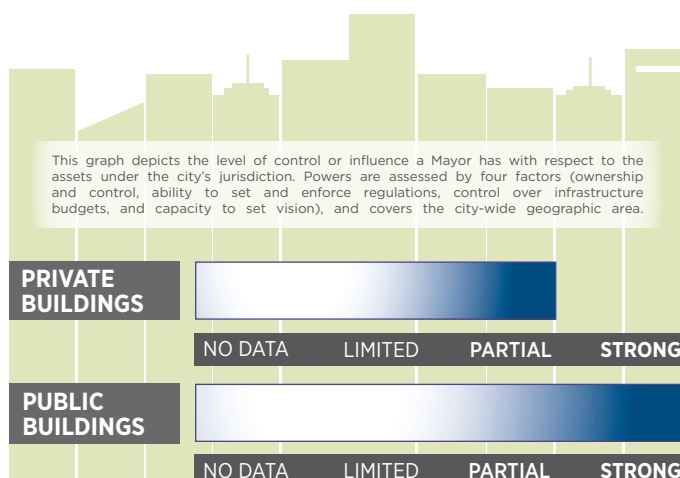


123	LEED Certified Projects (Mexico)
406	LEED Registered Projects (Mexico)
40	LEED Certified Projects (Mexico City)
136	LEED Registered Projects (Mexico City)



Graph depicts the distribution of LEED certified projects in Mexico City

MAYORAL POWERS



POLICY SPOTLIGHT:

In 1995, Mexico City launched the Program to Improve the Air Quality in the Mexico City Metropolitan Area (PROAIRE), shortly after the United Nations reported that Mexico City was the most polluted city on the planet in 1992. The program was updated in 2001 and 2011 to recalibrate the goals of the program and make them more stringent. The current version is set to expire in 2020.⁹

SUSTAINABLE COMMUNITIES

Mexico City's bicycle sharing program, EcoBici, was launched in February 2010. Since its inception, the program's size has quadrupled to include over 250 stations with over 4,000 bicycles. The program costs 400 pesos (US\$30) annually. Mexico City's Travel by Bike project included the construction of 300 kilometers of bike paths throughout the Federal District.¹⁰

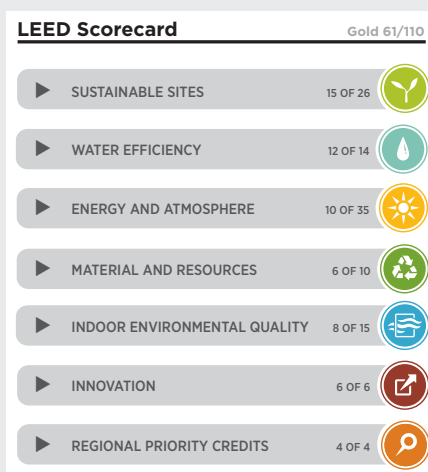
Mexico City's Climate Action Plan also established a bus rapid transit system, called Metrobus, through which 3,000 microbuses were replaced with 800 articulated or tandem buses. Over 200 kilometers of designated lanes were developed to accommodate the new buses and increased demand for public transportation.

Mexico City was awarded the 2013 Sustainable Transport Award from the Institute for Transportation and Development Policy. The award recognized the city's efforts in establishing and extending its bus rapid transit system as well as its cycling and walking infrastructure.

PROJECT SPOTLIGHT:

Torre Mayor

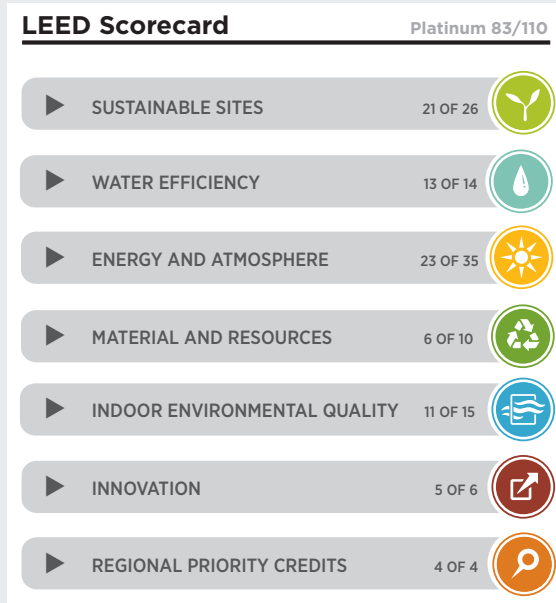
Torre Mayor achieved LEED Gold Certification under the LEED for Existing Buildings Rating System in June, 2013. The project's design resulted in a 30% reduction in indoor potable water use and an 88% reduction in potable landscape water use. Conventional commuting trips by building occupants decreased by 50%. Additionally, the project received a 74 Energy Star Performance Rating.¹¹



PROJECT SPOTLIGHT:

Torre HSBC Mexico

The HSBC Tower in Mexico City earned LEED Platinum Certification under the LEED for Existing Buildings Rating System in November 2012. The project earned a 93 Energy Star Performance Rating. Sustainable purchasing features include 60% of ongoing consumables, 40% of electric equipment, and 40% of furniture and ongoing consumables are reused, recycled or composted at a 50% rate. The design also reduced water use by 30%, and no potable water was used for landscaping.¹²



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GREEN BUILDING CITY MARKET BRIEF

RIO DE JANEIRO

BRAZIL



A NATIONAL MOVEMENT

The Minha Casa Minha Vida Program (MCMVP) is a national housing provision program that aims to increase access to housing for low-income families by enabling the production and acquisition of new housing units, while stimulating economic growth through investments in the construction sector. The program was launched by the Brazilian Federal Government in 2009 and has contracted over 3.4 million housing units, of which 1.7 million have already been delivered to the beneficiary families. The goal is to contract another 250,000 units before December 2014. The program is managed by the Brazilian Ministry of Cities and implemented by two federal banks, CAIXA Economica Federal and Banco do Brasil. Also included in MCMVP, is a systems of grants intended to cover the cost of solar water heating systems. Furthermore, the program allows for public buildings to be retrofitted in order to serve as housing developments for low-income families.¹

Presidential Executive Order 7.746/2012, signed in 2012, made it mandatory for public administrators to consider sustainability when awarding contracts. Bids for government contracts must specify the use of components that are non-toxic and biodegradable. Additionally, on the federal level, green building certifications, including LEED, can now be used to guide administrators' decisions.

SOCIAL HOUSING

Rio de Janeiro's urbanization plan, Morar Carioca, or Rio de Janeiro Living, aims to convert all of the city-state's favelas into neighborhoods by 2020. The project is funded by the City of Rio de Janeiro, the Brazilian Federal Government and the Inter-American Development Bank. The program provides public services to homes and communities, including the installation of new infrastructure and technical and financial assistance for the construction of homes.²

CITY EMISSIONS TARGET:

The City of Rio de Janeiro aims to reduce its greenhouse gas emissions by 20% below 2005 levels by 2020.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✓
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	6.3 Million
Land Area (km ²)	1,255
Gross Domestic Product (in USD billions) ³	83.9
Average Walk Score ⁴	73/100
Annual Rainfall (mm/year)	1,514
Climate Action Plan	No

BUILDING PERFORMANCE

EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁵	11,350,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

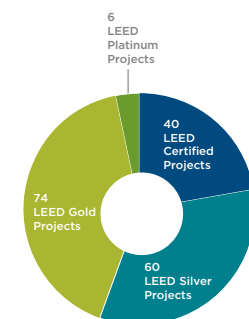
GREEN BUILDING PROFESSIONALS

LEED Credentialed Professionals (Brazil) ⁶	252
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PROJECT BREAKDOWN

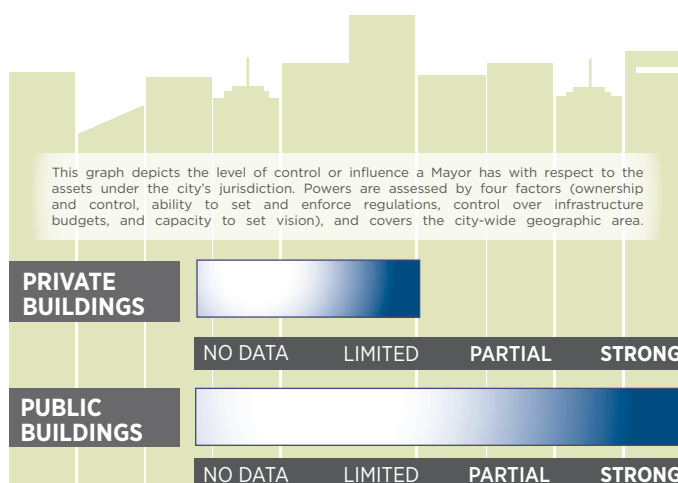


214	LEED Certified Projects (Brazil)
722	LEED Registered Projects (Brazil)
28	LEED Certified Projects (Rio de Janeiro)
117	LEED Registered Projects (Rio de Janeiro)



Graph depicts the distribution of LEED certified projects in Rio de Janeiro

MAYORAL POWERS



SUSTAINABLE COMMUNITIES

Rio de Janeiro's Pact for Sanitation was passed in 2010 to eliminate dumps, both legal and illegal, and establish municipal solid waste landfills. The program was proposed by the Rio de Janeiro Secretariat for the Environment when only 60% of all sewage generated was collected and, of that total, only 24% was properly treated. Specific goals of the plan include bringing sanitation to 80% of Rio's population by 2018, eliminating the use of illegal dumps within the city-state by 2014 and remediating those sites by 2016.⁷

In 2012, Rio de Janeiro adopted the Qualiverde Program (Decree 3.5745/2012), which provided a municipal definition for green building projects. New commercial and multifamily residential buildings that implement sustainability measures and achieve Qualiverde certification are eligible to receive tax benefits.

Qualiverde certification is flexible and offers an array of sustainability measures for consideration and inclusion. All certified projects must meet a minimum of 70 points, derived from the measures proposed in the decree. Additionally, projects that receive 100 points are awarded Qualiverde Total certification. For example, projects that include natural lighting in 50% of common areas earn 5 points and buildings with solar water heating systems are eligible for 5-10 points, depending on the percentage of hot water demand met. Bonus points are available for retrofit projects (15), third-party green building certification (5) and use of innovative technologies (1). The decree includes various actions relating to water management, energy efficiency and thermal performance of a project. A bill containing proposed benefits for Qualiverde projects is pending approval by the City Council and includes tax incentives, property tax reductions and exemptions from certain local building regulations.⁸

The Rio de Janeiro's Low Carbon City Development Program, launched in 2012, was instituted with the goal of reducing carbon emissions across the city-state. The initial program includes two separate initiatives: urban reforestation and the management of existing urban green space; and the development of BikeRio, a bike-sharing program with an extension and expansion of bike paths around the city.⁹

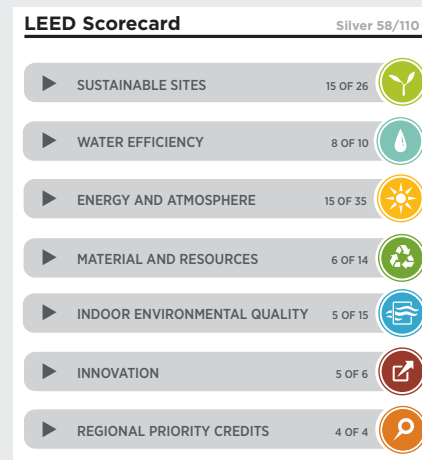
GREEN DISTRICTS

In the district of Ilha do Bom Jesus, or Fundão, the City of Rio de Janeiro developed an area to foster the establishment of green research and development companies. The building code for this new area requires companies residing in the district to achieve an international certification for sustainable buildings and to comply with certain mandatory requirements, including the installation of equipment for the treatment of all sewage. The government is also investing in the installation of recycled pavement and efficient street lighting.¹⁰

PROJECT SPOTLIGHT:

Projeto Exec Obra Reforma Adeq Maracanã

The Estádio Maracanã achieved LEED Gold Certification under the LEED for New Construction and Major Renovations 2009 Rating System in June 2014. 20% of materials used in the construction of the Stadium were extracted, harvested, recovered or manufactured within 500 miles of the construction site and construction and demolition debris were diverted from landfills at a rate of 75%. 55% of the existing building structure and envelope were reused and 9% of the stadium's energy is generated from renewable sources on-site.¹¹



Photograph Courtesy of Renan Bacellar

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GREEN BUILDING CITY MARKET BRIEF

SANTIAGO

CHILE



A NATIONAL MOVEMENT

In response to energy shortages in 2005, the Chilean Government established the National Energy Efficiency Program, which created the Chilean Energy Efficiency Agency. The agency is an independent not-for-profit entity responsible for overseeing and supporting the implementation of energy efficiency policies and initiatives.

The Light Up Good Energy project, set forth by the “Programa País de Eficiencia Energética” in 2008, has distributed close to three million compact florescent light bulbs to low-income residents, allowing them to save up to 25% on their monthly electric bills.

The Pre-Investment in Energy Efficiency project provides financial and technical assistance to small-and medium-sized companies seeking to reduce their energy consumption. Firms with annual net sales between US\$20,000 and US\$100,000 are eligible to apply for a subsidy of 70% of the total consultation costs, up to USD\$12,500.¹

GREEN CONSTRUCTION CODES

In 2012, Chile's Ministries for Public Works, Housing and Urban Development, and Energy and Environment signed an agreement announcing the formation of a National Strategy for Sustainable Construction. The strategy seeks to coordinate and link energy and environmental plans developed at the same time by local governmental entities. To this effect, the government aims to turn this tool into a coordinating agent of short-, medium- and long-term actions, goals and objectives. These objectives will be monitored through key performance indicators according to a defined schedule. One of the key aims of the strategy is to generate innovation, entrepreneurship, education and promotion of good practices both at an industrial and social level.²

NATIONAL EMISSIONS TARGET:

Chile aims to reduce its greenhouse gas emissions by 20% below 2007 business as usual levels by 2020.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✗
New/Existing Commercial Building Incentives	✗
New/Existing Residential Building Incentives	✗
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	6,683,853
Land Area (km ²)	641
Gross Domestic Product (in USD billions) ³	122
Average Walk Score ⁴	98/100
Annual Rainfall (mm/year)	312
Climate Action Plan	Yes

BUILDING PERFORMANCE

EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁵	19,592,190
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

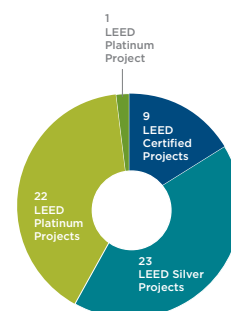
GREEN BUILDING PROFESSIONALS

LEED Credentialed Professionals (Chile) ⁶	97
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PROJECT BREAKDOWN

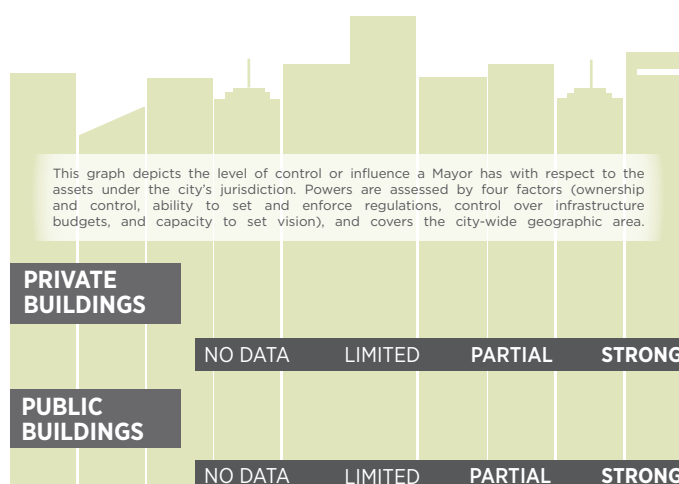


81	LEED Certified Projects (Chile)
208	LEED Registered Projects (Chile)
55	LEED Certified Projects (Santiago)
140	LEED Registered Projects (Santiago)



Graph depicts the distribution of LEED certified projects in Santiago

MAYORAL POWERS



CLIMATE ACTION SPOTLIGHT:

MAPS: Mitigation Action Plans and Scenarios

Mitigation Action Plans and Scenarios is a program based in South Africa that is being applied in Chile, as well as across the South American continent. It is a governmental cooperative that aims to provide projections for greenhouse gas emissions in Chile, possible options for reducing emissions, emissions projections if certain actions are taken as well as national challenges to proposed mitigation actions. The project is intended to inform the decision making process at all levels of government by providing concrete data and realistic options for reducing national greenhouse gas emissions.⁷

GREEN RESIDENTIAL BUILDINGS

In 2013, as part of the National Energy Efficiency Program, the Ministry of Housing and Urban Development (MINVU), in partnership with the Energy Ministry, introduced a system to determine the energy efficiency of a residential unit through a design and post-occupancy evaluation. This voluntary certification may become mandatory once a certain number of units certify under the system. MINVU is targeting social housing to improve energy efficiency and indoor environmental quality. So far more than 4,000 private and social houses have been certified.

Building upon the success of the National Energy Efficiency Program in residential buildings, MINVU expanded the scope to include overarching principles of sustainability with the release of the Chile Sustainable Dwelling Standard 2014, as a best-practice guide for newly constructed or renovated dwellings. The standard was created, and is managed by the Ministry of Housing and Urban Development. It focuses on four main categories of sustainability: energy, water, health and wellbeing, and other. An associated guide provides a comprehensive list of definitions, reference material, as well as information about the specific credits and categories. For instance, included in the standard are requirements for waste separation during the construction process and also during occupation of the building as well as human health considerations and energy and water efficiency.⁸

GREEN SCHOOLS

Chile has six projects registered under the LEED for Schools Rating system. Three of the projects are located in Santiago, one of which is a higher education project. The National System for Environmental Certification of Educational Facilities is a program coordinated by the Ministry of Environment and UNESCO. This system aims to enhance the educational process through environmental literacy and stewardship. The program awards one of three levels of certification based on environmental education, energy efficiency, climate change mitigation, ozone layer protection, waste management, biodiversity, air care and water conservation. By July 2014, 909 educational facilities were certified under this system, 17.49% (159) of which are located within the Metropolitan Region of Santiago.

URBAN DEVELOPMENT

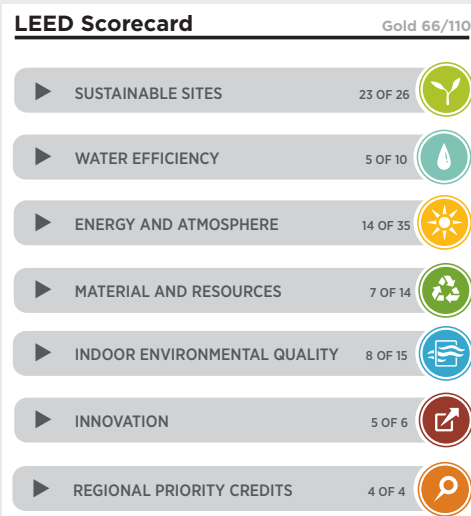
Santiago's Metropolitan Regulating Plan (Plano Regulador Metropolitano de Santiago), last updated in 2008, sets limits and requirements for urban extension, connectivity, inter-municipal parks and forestation areas. The General Law of Urbanism,

Construction and Ordinances also addresses limits of urban extension, land use, metropolitan and inter-communal equipment, restricted areas, land use intensity, and activities that have an impact on the metropolitan system and urbanization demands.

PROJECT SPOTLIGHT:

Universidad Diego Portales Biblioteca

The Universidad Diego Portales Biblioteca achieved LEED Gold certification under the LEED for New Construction Rating System in August 2012. The building design resulted in a 50% reduction in potable water for landscape use and a 40% reduction in baseline indoor water use compared to a modeled baseline. 20% of the building materials used were extracted, harvested, recovered or manufactured within a 500 mile radius of the project site. Half of the wood used in construction was certified sustainable by the Forest Stewardship Council and 75% of construction and demolition debris were diverted from landfills.⁹



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GREEN BUILDING CITY MARKET BRIEF

SAO PAULO

BRAZIL



A NATIONAL MOVEMENT

The Minha Casa Minha Vida Program (MCMVP) is a national housing provision program that aims to increase access to housing for low-income families by enabling the production and acquisition of new housing units, while stimulating economic growth through investments in the construction sector. The program was launched by the Brazilian Federal Government in 2009 and has contracted over 3.4 million housing units, of which 1.7 million have already been delivered to the beneficiary families. The goal is to contract another 250,000 units before December 2014. The program is managed by the Brazilian Ministry of Cities and implemented by two federal banks, CAIXA Economica Federal and Banco do Brasil. Also included in MCMVP, is a systems of grants intended to cover the cost of solar water heating systems. Furthermore, the program allows for public buildings to be retrofitted in order to serve as housing developments for low-income families.¹

Presidential Executive Order 7.746/2012, signed in 2012, made it mandatory for public administrators to consider sustainability when awarding contracts. Bids for government contracts must specify the use of materials that are non-toxic and biodegradable. Additionally, on the federal level, green building certifications, including LEED, can be used as tools to guide administrators' decisions.

LEADERSHIP BY EXAMPLE

In 2005, the 14.933 Law, which was unanimously approved by the São Paulo City Council established a requirement for the government to complete a city-wide greenhouse gas inventory every five years to benchmark and track progress related to emissions reduction efforts.

The law also included proposed efficiency and green space guidelines for public buildings. All new large buildings, both residential and commercial, must demonstrate waste recycling plans to obtain building permits. Another goal of the law is to improve city planning with the goal of increasing urban density and curbing sprawl.²

CITY EMISSIONS TARGET:

The City of São Paulo sought to reduce greenhouse gas emissions by 30% below 2005 levels by 2012.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	X
Energy Benchmarking and Data Transparency	X
Green Municipal Buildings	X
New/Existing Commercial Building Incentives	X
New/Existing Residential Building Incentives	X
Green Schools	X
Neighborhood-Scale Sustainability	X

CITY DETAILS

Population	11.4 Million
Land Area (km ²)	1,509
Gross Domestic Product (in USD billions) ³	166
Average Walk Score ⁴	98/100
Annual Rainfall (mm/year)	1,514
Climate Action Plan	No

BUILDING PERFORMANCE

EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁵	15,120,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

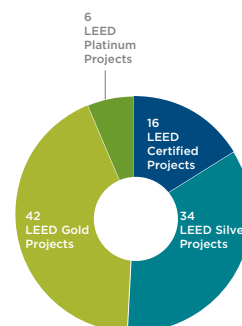
GREEN BUILDING PROFESSIONALS

LEED Credentialed Professionals (Brazil) ⁶	252
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PROJECT BREAKDOWN

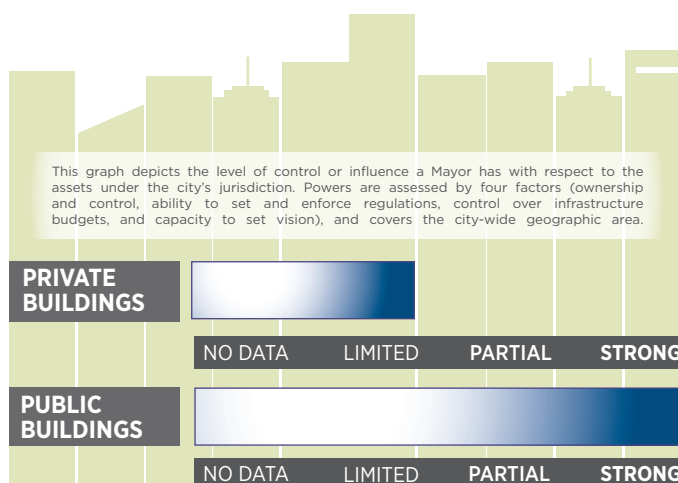


214	LEED Certified Projects (Brazil)
722	LEED Registered Projects (Brazil)
98	LEED Certified Projects (São Paulo)
232	LEED Registered Projects (São Paulo)



Graph depicts the distribution of LEED certified projects in São Paulo

MAYORAL POWERS



SOCIAL HOUSING

The City of São Paulo created its first municipal fund for housing policy in 1979, known as the Fund for Assistance to People Living in Substandard Housing or Fundo de Atendimento à População Moradora em Habitação Subnormal (FUNAPS). It was considered a milestone, as it started a new paradigm regarding informal settlements—rather than removing these displaced populations and communities, the local government endeavored to recognize and formalize their existence. The first female mayor of São Paulo, Luiza Erundida, who entered office in 1989, initiated the first participatory housing policy in support of this paradigm. This was realized through regular dialogue with social movements and by restructuring the municipal institutional architecture. Despite many difficulties, the guideline is widely considered a success, marked by collective and self-managed construction projects; however, the subsequent administration did not uphold the policy.

In the 1990's, the City of São Paulo developed the Cingapura program to move people out of the illegally constructed favelas and into more permanent structures. Recently, the City of São Paulo shifted its strategy to retrofitting existing favelas.

“Selo Casa Azul,” developed in Brazil, provides practical examples for social housing programs and green buildings. Selo Casa Azul was developed by CAIXA Econômica Federal. Recently, in addition to this financing program, CAIXA has developed an assessment tool with the intention to certify sustainability in buildings, including the social quality of the housing, energy and water efficiency, and overall sustainability of materials and resources. Selo Casa Azul also seeks to promote the rational use of natural resources, reduce maintenance costs and create awareness among developers and users about the importance and benefits of sustainable building.⁷

One of the success stories of Selo Casa Azul certification is a complex of 171 residential units located in the neighborhood of Paraisópolis (a popular district of São Paulo with a concentrated population of 60,000 people). Considerations, such as urban quality, thermal comfort, energy efficiency, the use of low-impact materials, water efficiency systems, and social justice, were the basis of development for the Paraisópolis project, backed by both the City of São Paulo and the DUCTOR Company. Selo Casa Azul seeks to respect the original topography of the land in its engineering efforts. This allows the project to effectively use natural resources and provides residents with access to public transport and basic services, while fostering positive social practices within the local community. The favorable satisfaction rate of its residents has been corroborated through interviews on the domestic comfort of residents' apartments. In turn, the savings of water and energy have had a positive impact on the household economy of users.

SUSTAINABLE COMMUNITIES

Under Law 14.933, the City of São Paulo sought to cut greenhouse gas emissions by 30% by 2012 through a number of measures. The plan aims to reduce fossil fuel use in public transportation by 10% annually with the goal to run on 100% renewable biofuels by 2017. Increases in public transportation access are planned to combat increasing car use in the city. The municipal government also plans to promote decentralized renewable energy generation, while ending subsidies for fossil fuel.⁸

In 2013, the City of São Paulo instituted the “Give Priority to Buses Program,” promoting the use of electric buses within the city. 300 kilometers of new exclusive bus lanes were developed and service was extended to include a 24 hour bus line.

As a result of these measures, bus speed has increased almost 7 kilometers per hour accommodating greater passenger ridership. The City has also begun construction on 400 kilometers of bicycle lanes to promote the use of non-motorized modes of transportation.⁹

PROJECT SPOTLIGHT:

Eldorado Business Tower

The Eldorado Business Tower achieved LEED Platinum Certification under the LEED Core and Shell Rating System in August 2009. Half of the wood used to construct the office building was certified by the Forest Stewardship Council and energy efficiency was improved by 17.5% over a modeled baseline for energy performance. 90% of occupied spaces have quality views. The project was awarded all five possible points under the Innovation in Design category.¹⁰

LEED Scorecard

Platinum 44/61

▶ SUSTAINABLE SITES

14 OF 15



▶ WATER EFFICIENCY

4 OF 5



▶ ENERGY AND ATMOSPHERE

7 OF 14



▶ MATERIAL AND RESOURCES

7 OF 11



▶ INDOOR ENVIRONMENTAL QUALITY

7 OF 11



▶ INNOVATION IN DESIGN

5 OF 5



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EUROPE

- ▶ AMSTERDAM
- ▶ ATHENS
- ▶ BARCELONA
- ▶ BASEL
- ▶ BERLIN
- ▶ COPENHAGEN
- ▶ ISTANBUL
- ▶ LONDON
- ▶ MADRID
- ▶ MILAN
- ▶ MOSCOW
- ▶ OSLO
- ▶ PARIS
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- ▶ ROTTERDAM
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- ▶ NORTH AMERICA
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GREEN BUILDING CITY MARKET BRIEF

AMSTERDAM

THE NETHERLANDS



A CITY-WIDE MOVEMENT

The Amsterdam Smart City project, started in 2009, has initiated 54 projects across the city aimed at creating a more sustainable, energy-efficient city. Specific initiatives of the project include: introduction of a car-sharing system, greening of Amsterdam's canals, smart traffic management, smart parking, the smart citizen kit, a vehicle-to-grid pilot program, introduction of an innovative health-lab, sustainable neighborhood design, flexible street lighting, free wifi hubs, and many more programs targeted at improving residents' quality of life, while making the Dutch capital more sustainable.¹

LEADING BY EXAMPLE

Amsterdam Definitely Sustainable 2011-2014 is a program intended to make the city more resilient. The four pillars propping up this program are: climate and energy, sustainable mobility and air quality, a sustainable, innovative economy, and materials and consumers. The plan stipulates that the municipal organization shall be climate-neutral by the end of 2015.²

BENCHMARKING

Under the Definitely Sustainable program, Amsterdam will benchmark its performance across many sectors including energy efficiency in existing buildings, renewable energy production, electric transportation, air quality, use of raw materials, and much more.

PRIVATE SECTOR INCENTIVES

Amsterdam property owners can apply for a subsidy of €50 per square meter of green roof installed on their property, up to a maximum of 50% of the total installation costs or 20,000 euros; whichever figure is lower.³

CITY EMISSIONS TARGET:

The city of Amsterdam aims to achieve a 40% reduction in emissions by 2025 compared with 1990 emissions.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✓
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	810,909
Land Area (km ²)	219
Gross Domestic Product (in USD billions)	322.3
Average Walk Score ⁴	98/100
Annual Rainfall (mm/year)	838.2
838Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁵	5,090,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (The Netherlands) ⁶	32
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PROJECT BREAKDOWN

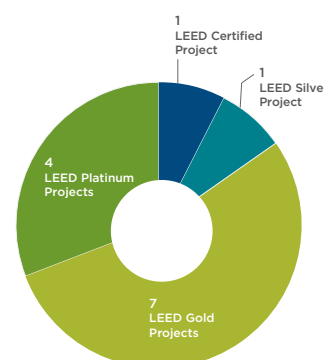


9
LEED Certified
Projects (Amsterdam)

10
LEED Registered
Projects (Amsterdam)

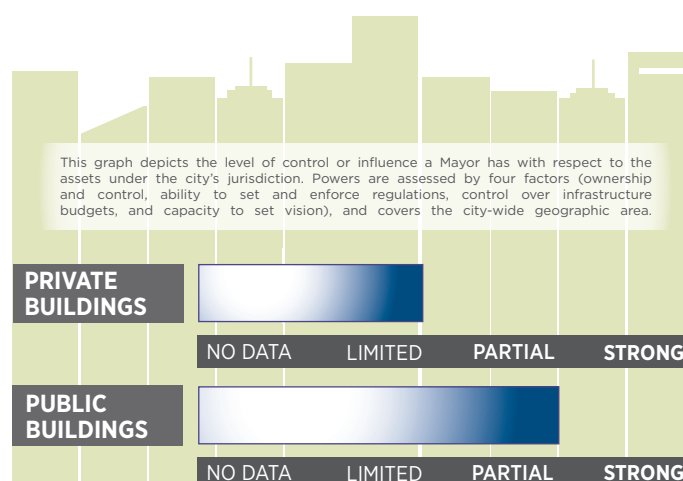
13
LEED Certified Projects
(The Netherlands)

22
LEED Registered Projects
(The Netherlands)



Graph depicts the distribution of LEED certified projects in the Netherlands

MAYORAL POWERS



POLICY SPOTLIGHT:

Structural Vision Amsterdam 2040 is a long-term plan that places emphasis on six spatial tasks that will drive the Dutch capital in a sustainable manner. The six tasks included in the city's structural vision are: densification, transformation, public transport on a regional scale, high quality layout of public space, investment in the recreation use of green space and water, and conversion to sustainable energy. The policy received the ISOCARP (International Society of City and Regional Planners) award for excellence in 2011.⁷

GREEN RESIDENTIAL BUILDINGS

Through the Amsterdam Smart City initiative, more than five hundred homes in Amsterdam have been outfitted with smart meters that will enable residents to become more aware of their energy use. The project includes informational sessions, as well as prizes that are awarded to residents for sharing useful ideas on how to better save energy.⁸

Additionally, all new construction in Amsterdam must be climate-neutral by 2015 - whether residential, commercial, industrial, or public buildings. Under the initiative, the built environment in the city will undergo significant retrofitting to ensure energy efficiency in the existing building stock.

GREEN SCHOOLS

Included in the Amsterdam Smart City project are initiatives aimed at increasing the sustainability of the city's schools. The Smart Schools project facilitates a competition amongst six primary schools regarding energy efficiency program results. Participating schools received toolkits consisting of lessons and accompanying assignments on energy and energy saving measures. This project reaches thousands of students across the city annually.⁹

SUSTAINABLE COMMUNITIES

The municipality has worked hard to encourage bicycle use within the city by providing designated cycling lanes, bicycle and pedestrian friendly roads, as well as an extensive network of parking facilities for bicycles. Approximately three out of four residents own a bicycle in the city, making bikes the most popular mode of transportation.¹⁰

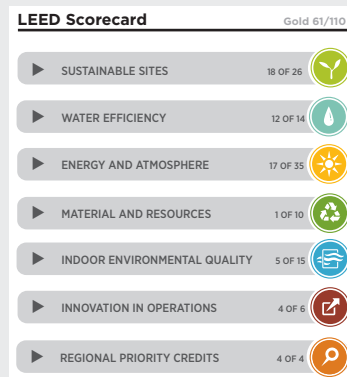
PROJECT SPOTLIGHT:



Photo courtesy of Flickr Creative Commons user Stewart Leiwakabessy

ABN AMRO Headquarters

ABN AMRO Headquarters was certified Gold under the LEED for Existing Buildings 2009 rating system in March 2014. The project achieved a 100% reduction in potable water used for landscaping and a 30% reduction in indoor potable water use, both against a modeled baseline. Ongoing consumables are reused, recycled, or composted at a 50% rate. Building occupants experienced a 63% reduction in conventional commuting trips. The building also received an 80 ENERGY STAR® Performance Rating.¹¹



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GREEN BUILDING CITY MARKET BRIEF

ATHENS

GREECE



A CITY-WIDE MOVEMENT

Re-think Athens is a project designed to re-invent the city center to be resilient, accessible, and vibrant. The project's resiliency measures include the greening of the city center to contribute to the alleviation of the heat island effect, and the implementation of stormwater management systems to reduce infrastructure overflow and flooding. Athens intends to become more accessible by diverting motor vehicles and decreasing traffic congestion, making the city more pedestrian and cyclist friendly. Bike lanes and tram lines are planned to help Athens achieve this goal. The project also entails retrofitting several of the city's vacant buildings to be vibrant cultural hubs for the community to meet and exchange ideas and knowledge.¹

GREEN CODES

In Greece, an energy performance study is required to receive a building permit. The study is mandatory for new construction and renovations to existing structures with a floor area of more than 1,000 square meters. Structures receiving a score below 'category B' are assessed as illegal and must be upgraded to comply with minimum requirements.²

An energy efficiency certificate is required before any real estate transaction of a property (i.e., sale, lease, or rent), may be executed. However, this requirement excludes industrial properties of 50 square meters or more.

PRIVATE SECTOR INCENTIVES

Launched in February 2011, the national Efficient Use of Energy and Energy Saving program offers citizens incentives to carry out energy efficiency measures on their property. Incentives are available to property owners for the improvement of thermal insulation, replacement of window/door glazing, replacement of inefficient boiler systems with more efficient alternatives, and installation of solar water heaters.³

CITY EMISSIONS TARGET:

The European Union and its member states are committed to a quantified economy-wide emissions reduction target of 20% by 2020, compared to 1990 levels.⁴

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✗
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✗
Neighborhood-Scale Sustainability	✗

CITY DETAILS

Population	664,000
Land Area (km ²)	39
Gross Domestic Product (in USD billions)	125
Average Walk Score ⁵	97/100
Annual Rainfall (mm/year)	414
Climate Action Plan	No

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁶	4,470,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Greece) ⁷	33
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PROJECT BREAKDOWN

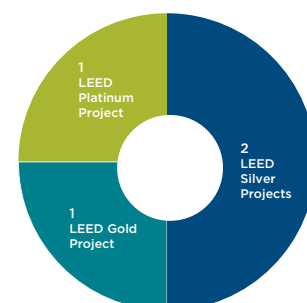


4
LEED Certified
Projects (Athens)

9
LEED Registered
Projects (Athens)

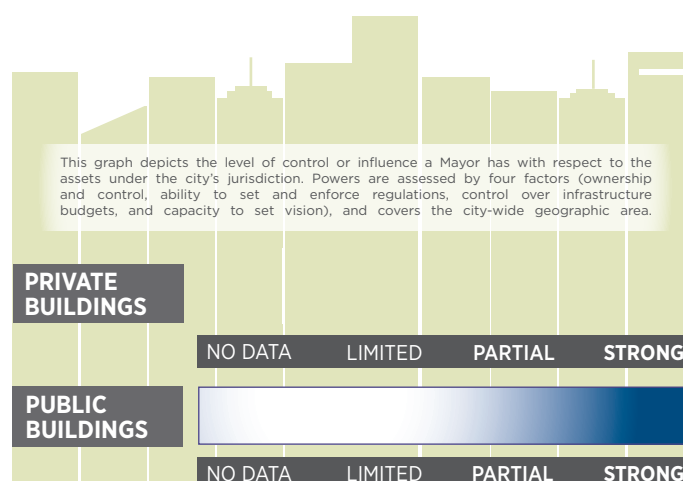
4
LEED Certified
Projects (Greece)

12
LEED Registered
Projects (Greece)



Graph depicts the distribution of LEED certified projects in Greece

MAYORAL POWERS



POLICY SPOTLIGHT:

Re-launch Athens is a program of the Municipality of Athens that focuses on smart, sustainable, and inclusive growth. It intends to restore the competitiveness of the local economy by retrofitting abandoned buildings, transforming them into business incubators that will provide jobs to the city's unemployed residents. The program calls for an upgrade to citizens' quality of life, to be achieved by implementing a variety of projects including the creation of bike lanes and a bike-share system. To regenerate the urban environment, abandoned, deteriorated areas will be transformed into green spaces that not only improve the urban landscape, but contribute to the alleviation of the heat island effect.⁸

GREEN RESIDENTIAL BUILDINGS

The aim of the Energy Efficiency in Household Buildings Program is to determine a building's energy consumption and reveal steps that will maximize energy efficiency. The program consists of a revolving loan fund that dispenses low-interest financing to residents for energy efficient upgrades to their properties. The program also covers the cost of an initial energy audit. It is open to households earning less than €80,000.00 annually. Income levels affect loan structure.⁹

SUSTAINABLE COMMUNITIES

Implementation of the city's Mobility Management Plan began in 2010, with the aim of decreasing emissions in the transportation sector. Specific objectives in the plan include:

- Improving environmental conditions by reducing the negative impact of road traffic
- Improving the quality and comfort of public transportation
- Increasing safety measures for pedestrians and cyclists
- Supporting the accessibility of city economic centers¹⁰

PROJECT SPOTLIGHT:

EREN Athens Office

The EREN Athens Office achieved Silver Certification under the LEED for New Construction rating system in June 2014. The building's design resulted in a 50% reduction in potable landscape water use and a 35% reduction in indoor water use, both against a modeled baseline. Half of construction and demolition debris associated with the project was diverted from landfills. 20% of materials used in construction were extracted, harvested, recovered or manufactured within a 500 mile radius of the building site. Additionally, 1% of the buildings power needs are met through on-site renewable energy generation.¹¹

LEED Scorecard

Silver 56/110

▶ SUSTAINABLE SITES	23 OF 26	
▶ WATER EFFICIENCY	4 OF 10	
▶ ENERGY AND ATMOSPHERE	3 OF 35	
▶ MATERIAL AND RESOURCES	6 OF 14	
▶ INDOOR ENVIRONMENTAL QUALITY	11 OF 15	
▶ INNOVATION IN OPERATIONS	6 OF 6	
▶ REGIONAL PRIORITY CREDITS	3 OF 4	

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GREEN BUILDING CITY MARKET BRIEF

BARCELONA

SPAIN



A CITY-WIDE MOVEMENT

A decade after the implementation of Agenda 21, a plan used as a 10-year roadmap for the city's commitment to sustainability, Barcelona developed Commitment 22 in 2012. The commitment consists of ten overarching themes, each with ten specific targets. For example, under environmental quality and health, the city hopes to improve air quality, create low-emission zones, improve citizen acoustic comfort, improve the quality of drinking water, promote the production and sale of healthier foods, as well as enrich both the indoor and outdoor environment with vegetation and natural elements to improve quality of life and health.¹

LEADING BY EXAMPLE

The Barcelona Smart City Program is aimed at making municipal operations more energy efficient and environmentally sustainable. The program includes seven strategic initiatives ranging from the implementation of smart street lighting to smart energy and water use in city operations. Two of the initiatives target transportation, with goals of improving the public transportation system operations and encouraging the use of zero-emission vehicles - both in the private and public sectors. Also under the Smart City Program, the Barcelona government has instituted a program to make municipal activities more transparent to citizens by installing 44 "citizen's attention" kiosks that will provide residents with clear, understandable information and data regarding the city's actions. Additionally, Barcelona created an open-data website in 2010.²

GREEN CODES

Barcelona is the first city in Europe to adopt a solar thermal ordinance requiring solar energy to be used to supply 60% of running hot water in all newly constructed buildings, renovated buildings, or buildings changing their use type. The ordinance applies to health facilities, residential properties, commercial developments, industrial plants, and sports complexes. Compliance is overseen by the Barcelona Energy Agency. The ordinance has resulted in over 25,000 MWh per year of energy savings.³

CITY EMISSIONS TARGET:

The city of Barcelona aims to reduce carbon emissions by 23% by 2020 compared with 2008 levels.⁴

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✗
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	1.62 million
Land Area (km ²)	101.9
Gross Domestic Product (in USD billions)	171
Average Walk Score ⁵	98/100
Annual Rainfall (mm/year)	640
Climate Action Plan	Yes

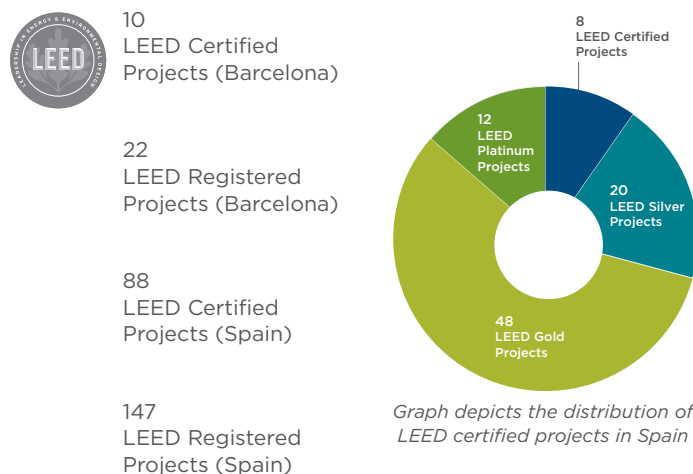
BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁶	3,783,980
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

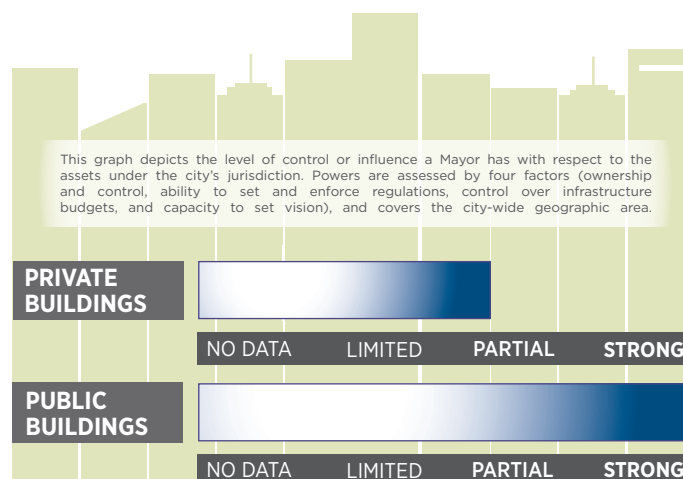
MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Spain) ⁷	257
--	-----

PROJECT BREAKDOWN



MAYORAL POWERS



POLICY SPOTLIGHT:

The Barcelona Green Infrastructure and Biodiversity Plan 2020, developed by the Barcelona City Council, aims to preserve and enhance the natural areas of the city, while creating a more resilient Barcelona. The plan consists of ten strategies outlined as priority actions that will help to obtain the maximum amount of social and environmental services from the city's green infrastructure and biodiversity.⁸

PRIVATE SECTOR INCENTIVES

The Housing Consortium of Barcelona awards monetary aid in order to promote weatherization retrofits in the residential sector. Aid is available to homeowners seeking to improve their property's insulation, upgrade HVAC equipment, or install renewable energy technology – such as solar photovoltaic systems. In order to qualify for monetary aid, work must not yet have started on the project in question, 70% of the building must be designed for residential purposes, and the minimum cost of proposed work should be cost €2,000, at minimum.⁹

GREEN SCHOOLS

Barcelona's Department of the Environment offers environmental education materials, consisting of projects and resources such as programmed activities for students and informational services. Projects include field trips to natural areas, debates, gardening training, and the Schools Mobile Green Point. The Schools Mobile Green Point is a vehicle that travels from school to school collecting waste sorted by the students to be recycled, repurposed, or reused.¹⁰

SUSTAINABLE COMMUNITIES

Through Commitment 22, Barcelona has developed a strategy consisting of multiple initiatives to create a more sustainable, resilient city. In promoting safe, sustainable mobility - Barcelona will expand its current network of bicycle lanes. The use of private vehicles will be discouraged through increased traffic control and the use of electric vehicle technology for public transportation.¹¹

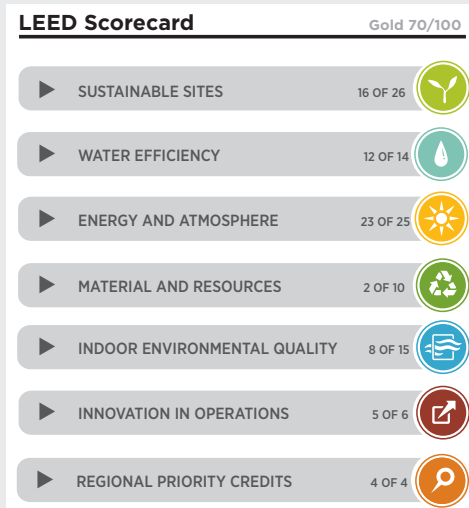
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PROJECT SPOTLIGHT:

Diagonal 640

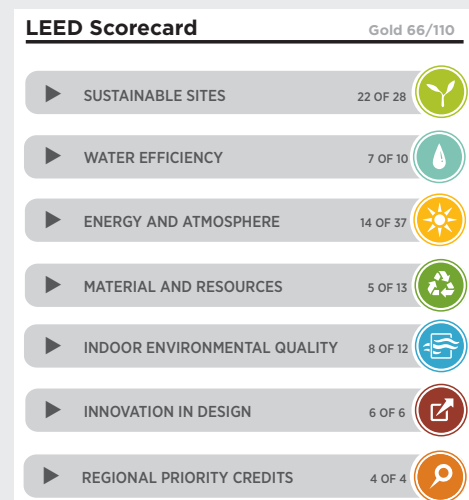
Barcelona's Diagonal 640 building achieved Gold certification under the LEED for Existing Buildings rating system in June 2014. The project's design resulted in a 30% reduction in indoor potable water use along with a 100% reduction in potable landscape water use, both against a modeled baseline. Occupants experienced a 50% reduction in conventional commuting trips. The building also received an 83 ENERGY STAR® Performance Rating.¹²



PROJECT SPOTLIGHT:

Cornerstone

Barcelona's Cornerstone building achieved Gold certification under the LEED Core & Shell rating system in June 2013. The building's design resulted in a 40% reduction in baseline indoor water use, a 50% reduction in wastewater generation, and a 50% reduction in potable water used in landscaping, all against a modeled baseline. Construction and demolition debris associated with the project was diverted from landfills at a rate of 75%.¹³



GREEN BUILDING CITY MARKET BRIEF

BASEL

SWITZERLAND



A CITY-WIDE MOVEMENT

Novatlantis, a public/private entity that seeks to promote sustainability in the Swiss Federal Institutes of Technology Domain (ETH Domain) has developed an energy savings initiative entitled "2000 Watt Society." The program's goal is to reduce energy consumption per capita in Switzerland by a factor of three from the current 6,000 watts to 2,000 watts. Of those 2,000 watts, 75% is expected to come from renewable sources. Before the national rollout of the program, Basel was selected as a pilot region for the initiative. The pilot program of the 2000 Watt Society will observe which construction techniques, such as green building will be relevant for the initiative along with the role renewable energy will have in helping reach the 2,000 watt society goal.¹

LEADING BY EXAMPLE

In 2005, the administration of the Canton of Basel-Stadt committed to a goal of becoming a carbon-neutral administration over a period of 25 years through a combination of reduction measures, such as energy efficiency in Cantonal buildings. To help achieve this goal, in 2008, the Grand Council approved a 33.5 million Swiss francs (\$36.7USD million) credit to be used for energy-efficient renovations in Cantonal buildings. Also in 2008, standards were set for new buildings and building renovations stipulating that new buildings must meet Minergie-P or similar standards, and renovations must fulfill the requirements of Minergie renovations.²

GREEN CODES

In 2002, the city of Basel passed an amendment to its Building and Construction Law (paragraph 72) requiring all new and renovated flat roofs be greened according to stipulated design guidelines. Design guidelines include requirements that the area consist of native regional soils, be at least 10 centimeters deep, consist of a mix of native plant species, and include a mound or mounds – each 30 centimeters high and 3 meters wide to provide habitat space for animals. Additionally, for flat roofs over 1,000 square meters the city's green roof expert must be consulted during design and construction.³

NATIONAL EMISSIONS TARGET:

Switzerland aims to reduce its greenhouse gas emissions by 20% by 2020 compared with 1990 levels.⁴

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	174,000
Land Area (km ²)	23.91
Gross Domestic Product (in USD billions) ⁵	32
Average Walk Score ⁶	100/100
Annual Rainfall (mm/year)	842
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e)	--
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Switzerland) ⁷	34
--	----

PROJECT BREAKDOWN

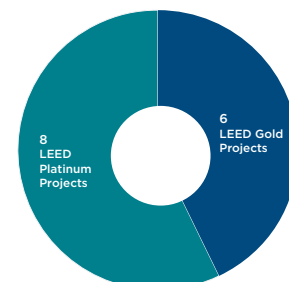


0
LEED Certified Projects
(Basel)

1
LEED Registered
Project (Basel)

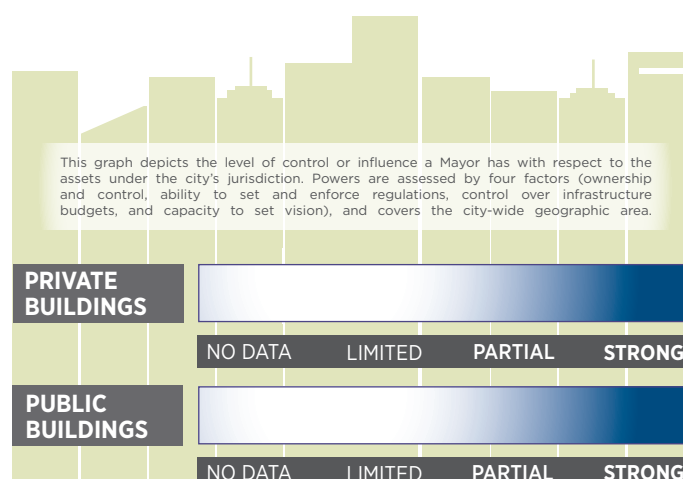
14
LEED Certified Projects
(Switzerland)

30
LEED Registered
Projects (Switzerland)



Graph depicts the distribution of LEED certified projects in Switzerland

MAYORAL POWERS



POLICY SPOTLIGHT:

In 1998, the Canton of Basel-Stadt Parliament approved Switzerland's first tax incentive on electricity and established the power-savings fund. A small tax is levied on each kWh, meaning higher consumers pay more in taxes. The revenue generated from the tax goes into the power-savings fund to be redistributed amongst all utility ratepayers once a year.

PRIVATE SECTOR INCENTIVES

Financial assistance is available from the Canton of Basel-Stadt to property owners seeking to improve the energy efficiency of their buildings. Incentives are available for whole building retrofits, single component refurbishment, the installation of solar systems, and the installation of heat pumps or wood heating systems. For example, property owners that elect to replace old windows with newer, more efficient models are eligible to receive 70 Swiss francs per square meter of windows installed and upgrades to the façade or roof qualify for an incentive of 40 Swiss francs per square meter.⁸

To encourage the installation of solar photovoltaic panels on rooftops throughout the city, the government of Basel-Stadt instituted a program that supplies interested property owners with a free, independent consultation service and pays up to 40% of the total costs incurred for the purchase and installation of panels.⁹ Additionally, the canton maintains a map of the city detailing building's suitability for the installation of solar photovoltaic panels.

GREEN SCHOOLS

To promote the vision of a 2,000 watt society, Basel school children have the option of becoming "energy detectives." The program is open to school children from ages 8 to 16 who are interested in sustainability and how their behavior affects the environment. Detectives receive informational material on subjects ranging from energy efficiency to smart consumption, and participate in events and competitions.¹⁰

SUSTAINABLE COMMUNITIES

In 2011, the Canton of Basel-Stadt instituted a park-and-ride initiative to provide residents in rural areas with access to public transportation to and from the city center. Since its inception,

approximately 2,000 park-and-ride spaces have been created. Funds for the initiative come from parking fees within the city.¹¹

Through the environmental protection law (S13), Basel aims to stabilize and reduce emissions from traffic and to increase the share of environmental-friendly public transportation.

BUILDING ENERGY RATING SYSTEM

The Swiss system MINERGIE was created in 1998, and updated in 2007. It is managed by a non-profit association and is intended to reduce building energy consumption by 60%, compared to conventional structures. The system focuses only on the amount of energy delivered to a site, allowing building owners/managers to make up for inefficient features by incorporating higher-efficiency features. All 26 Swiss cantons are members of the MINERGIE Association.¹²

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GREEN BUILDING CITY MARKET BRIEF

BERLIN

GERMANY



LEADING BY EXAMPLE

The city of Berlin developed ecological construction requirements for all public projects as well as private projects receiving funding from the city. The requirements stipulate that projects must be prepared and implemented in a way that preserves both the environment and natural resources, supports action to enhance climate conditions, is socially acceptable and compatible with the environment, and ensures and establishes sound living and working conditions on a sustained basis in the phase of construction, operation, and its demolition.¹

GREEN CODES

Berlin, through its water utilities, has implemented a stormwater fee system, wherein, property owners are charged based on the amount of impervious surface on their respective land. This fee system promotes low impact, environmentally friendly design while, simultaneously, encouraging dense development. Additionally, the fees raise public awareness regarding stormwater issues and the overall health of the watershed.²

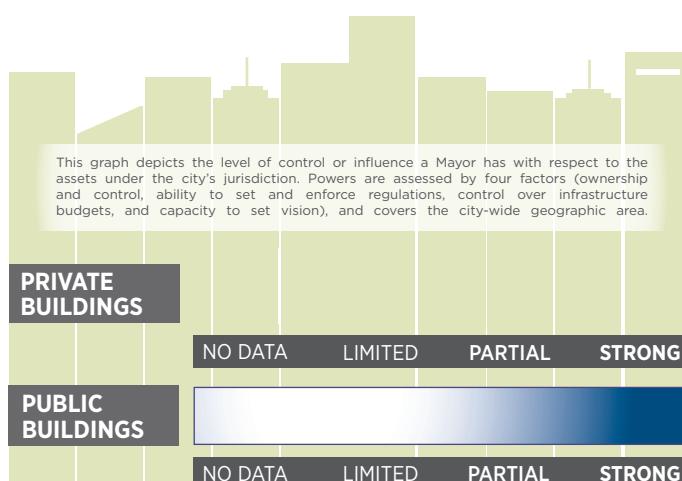
PRIVATE SECTOR INCENTIVES

Berlin Energy Saving Partnership is a cooperative program initiated by the city of Berlin and the Berlin Energy Agency that offers financial assistance for the energy efficient retrofitting of both public and private buildings. Financial savings are delivered immediately through guaranteed contracts. Energy efficiency upgrade investments in large buildings are encouraged through building pools.³

CITY EMISSIONS TARGET:

The city of Berlin hopes to achieve a 40% emissions reduction by 2020, compared with 2005 levels.⁴

MAYORAL POWERS



CITY DETAILS

Population	3.44 million
Land Area (km ²)	892
Gross Domestic Product (in USD billions)	143.3
Average Walk Score ⁵	100/100
Annual Rainfall (mm/year)	752
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁶	20,170,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Germany) ⁷	215
DGNB Credentialed Professionals (Germany) ⁸	702

PROJECT BREAKDOWN



13
LEED Certified
Projects (Berlin)

27
LEED Registered
Projects (Berlin)

136
LEED Certified
Projects (Germany)

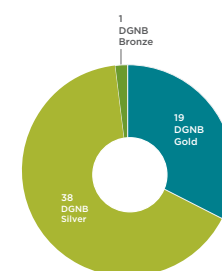
273
LEED Registered
Projects (Germany)

746
DGNB Certified
Projects (Germany)

58
DGNB Certified
Projects (Berlin)



Graph depicts the distribution of LEED certified projects in Germany



Graph depicts DGNB Certified projects in Berlin

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✗

GREEN SCHOOLS

Instituted in Berlin's schools, the fifty/fifty program is meant to teach children where energy comes from, how to use it more efficiently, and what the benefits of energy efficiency are for the environment. After receiving lessons, the students tour their respective schools to observe where energy is being wasted and what measures have been taken to save energy. Through the program, students also learn about the causes and effects of anthropogenic climate change.⁹

PROJECT SPOTLIGHT:

Potsdamer Platz

Berlin's Potsdamer Platz received a Silver DGNB, a rating system developed by the German Sustainable Building Council, City District Certificate in 2011. The 13 hectare infill development sits on a remediated brownfield site in the city, helping to alleviate urban sprawl while maintaining community connectivity. The site features comprehensive a comprehensive rainwater management system that stores and purifies water in underground cisterns to be reused in buildings and for irrigation purposes. Additional sustainability measures include an integrated waste management system and a bike-share program.¹⁰

- **Project Evaluation: 74%**
- Economic Quality: 61%
- Economic Quality: 89%
- Sociocultural and Functional Quality: 75%
- Technical Quality: 75%
- Process Quality: 70%

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POLICY SPOTLIGHT:

Berlin Step Klima Plan is an integrative, cross-departmental initiative comprising of effective strategies aimed at improving the quality of life in the city and preparing for climate change. The plan focuses specifically on four spatial fields of action: bioclimatic conditions in urban areas, green and open spaces, water quality and heavy rain, and climate protection.¹¹

PROJECT SPOTLIGHT:

EUREF Campus Building

Building 12 on Euref's Berlin Campus achieved Platinum certification under the LEED Core & Shell 2009 rating system in July 2014. The building's design resulted in a 100% reduction in potable landscape water use, a 50% reduction in wastewater generation, and a 35% reduction in baseline indoor water use – all compared to a modeled baseline. Construction and demolition debris associated with the project was diverted from landfills at a rate of 75%. 20% of materials used in building construction were extracted, harvested, recovered, or manufactured within a 500 mile radius of the building site. Additionally, 1% of the buildings energy needs are met through on-site renewable generation.¹²

LEED Scorecard

Platinum 84/110

▶	SUSTAINABLE SITES	26 OF 28	
▶	WATER EFFICIENCY	9 OF 10	
▶	ENERGY AND ATMOSPHERE	25 OF 37	
▶	MATERIAL AND RESOURCES	6 OF 13	
▶	INDOOR ENVIRONMENTAL QUALITY	8 OF 12	
▶	INNOVATION IN DESIGN	6 OF 6	
▶	REGIONAL PRIORITY CREDITS	4 OF 4	

GREEN BUILDING CITY MARKET BRIEF

COPENHAGEN

DENMARK



A CITY-WIDE MOVEMENT

The city of Copenhagen was awarded the 2014 European Green Capital Award by the European Commission. The Danish capital was recognized as a model of urban planning and design. Copenhagen has placed public-private partnerships at the core of its approach to sustainability. The city works with companies, universities, and non-governmental organizations to develop and implement green growth.¹

LEADING BY EXAMPLE

Copenhagen's goal of becoming carbon neutral by 2025 includes many initiatives at the municipal level aimed at reducing emissions and energy intensity. Energy consumption in municipal buildings is expected to be reduced by 40% through benchmarking energy performance, enhanced energy management, and energy retrofiting. Additionally, 60,000 square meters of solar panels will be installed on new and existing municipal building projects.²

GREEN CODES

The Danish Building Code includes energy performance guidelines for dwellings, offices, and schools - including those classified as low energy performance buildings. The building code includes a stipulation that buildings must be planned, designed, built, and fit-out to ensure satisfactory conditions for users. This includes prohibiting the use of building materials that emit gases, vapors, particles, or ionizing radiation that can result in an unhealthy indoor environment.³

SUSTAINABLE COMMUNITIES

The city of Copenhagen has begun the construction of a network of bicycle lanes called the "cycle super highways," intended to connect central Copenhagen with its surrounding suburbs. The first completed lane connected Copenhagen with the suburban town of Albertslund, 22 km from the city center. The planned network will include 26 Cycle Super Highways, covering a total area of around 300 km. The €40.3 million public expenditure will increase the number of bike lanes in the city by 15%. Riders will enjoy features such as air pumps, safer intersections, and traffic lights timed to the average cycling speed, reducing the number of stops for riders. The project requires 22 municipalities in the Greater Copenhagen Area to collaborate in order build the new network of cycling routes.⁴

CITY EMISSIONS TARGET:

The city of Copenhagen aims to reduce emissions by at least 20% by 2015 compared with 2005 levels.⁵ Through the implementation of its Climate Adaptation Plan, Copenhagen hopes to be carbon neutral by 2025.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✓
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✗
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	570,000
Land Area (km ²)	86.2
Gross Domestic Product (in USD billions)	116.5
Average Walk Score ⁶	100/100
Annual Rainfall (mm/year)	612
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁷	2,120,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Denmark) ⁸	22
--	----

PROJECT BREAKDOWN



3
LEED Certified
Projects (Copenhagen)

5
LEED Registered
Projects (Copenhagen)

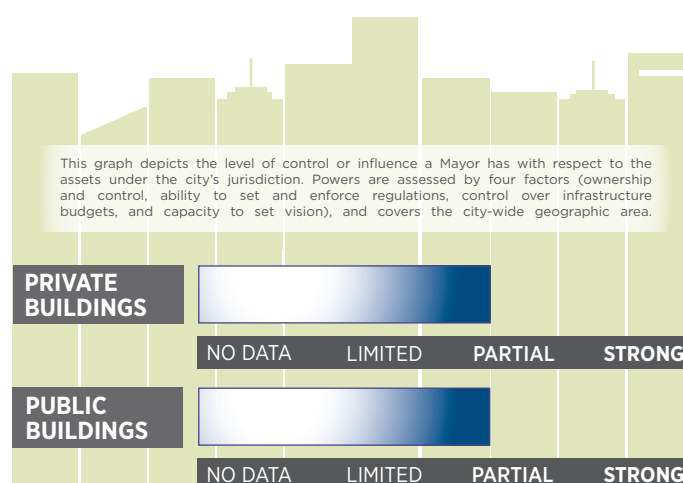
7
LEED Certified Projects
(Denmark)

15
LEED Registered
Projects (Denmark)



Graph depicts the distribution of LEED certified projects in Denmark

MAYORAL POWERS



POLICY SPOTLIGHT:

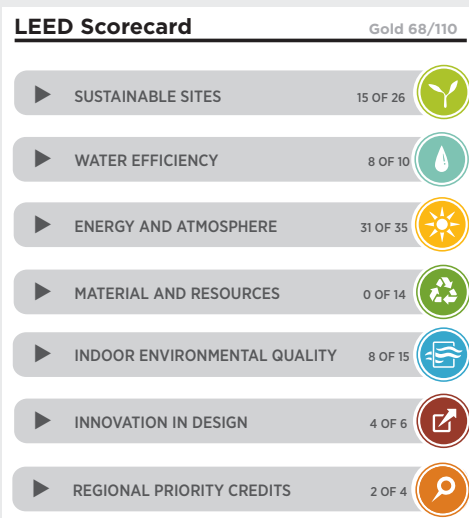
In 2013, the city of Copenhagen received an INDEX: Award in the community category for its Climate Adaptation Plan. The plan includes strategies and initiatives aimed at making the Danish capital carbon neutral by 2025. It targets the following strategies in buildings as way to help the city achieve its 2025 goal:

- Increasing the use of passive cooling in buildings
- Protecting existing buildings from flooding
- Increasing building insulation
- Incorporating green aspects in private and public buildings
- Establishing stormwater management practices⁹

PROJECT SPOTLIGHT:

Green Lighthouse

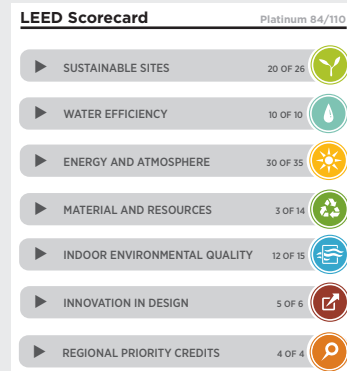
Copenhagen's Green Lighthouse achieved Gold certification under the LEED for New Construction rating system in November 2011. The building's design resulted in a 40% reduction in baseline indoor water use and a 100% reduction in potable water use, both against a modelled baseline. The building generates 13% of its power on-site, from renewable sources.¹⁰



PROJECT SPOTLIGHT:

UN City

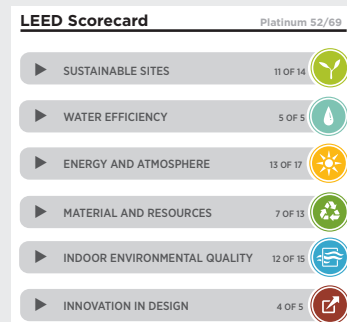
UN City earned Platinum certification under the LEED for New Construction 2009 rating system in December, 2013. The project achieved a 40% reduction in baseline indoor water use and a 50% reduction in wastewater generation, both against a modeled baseline. Half of all wood products used in the project were certified by the Forest Stewardship Council. The building generates 7% onsite renewable energy and 35% of its power is supplied by renewable sources through a green power purchase agreement.¹¹



PROJECT SPOTLIGHT:

Nordhuset

Copenhagen's Nordhuset building achieved Platinum certification under the LEED for New Construction rating system in June 2013. The building's design resulted in a 50% reduction in potable landscape water use and a 20% reduction in baseline indoor water use, both against a modeled baseline.¹²



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GREEN BUILDING CITY MARKET BRIEF

ISTANBUL

TURKEY



A NATIONAL MOVEMENT

The National Climate Change Strategy for Turkey was approved by the Higher Planning Council on May 3, 2010. It seeks to contribute to global efforts that are being carried out to prevent climate change by achieving the following:

- Integrating policies and measures for mitigating and adapting to climate change
- Contributing to the global greenhouse gas emissions mitigation policies and measures
- Increasing national preparedness and capacity in order to avoid the adverse impacts of global climate change
- Increasing access to the financial resources required for undertaking mitigation and adaption activities
- Raising public awareness in support of changing consumption patterns
- Establishing an integrated information management system in order to increase the flow and exchange of knowledge

Building-specific objectives include: effective implementation of the regulation on energy performance in buildings, developing instruments that will provide the necessary financial support regarding energy efficiency, the issuance of energy performance certificates to all new buildings until 2017, and generating at least 20% of the annual energy demand of new buildings from renewable sources by 2017.¹

GREEN CODES

The Turkish Ministry of Environment and Urbanization requires buildings to meet minimum performance criteria and standards concerning design, heat insulation, heating and cooling systems, and energy use. Energy performance certificates are given to buildings disclosing information on energy expenses and projected Co2 emissions for new buildings as well as existing buildings which are in the process of being sold or rented.²

NATIONAL ENERGY INTENSITY REDUCTION:

Under the National Climate Change Strategy, energy consumption in public buildings is to be cut by 10% by 2015 and by 20% by 2023, both compared with 2011 levels.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✗
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✗

CITY DETAILS

Population	14.2 million
Land Area (km ²)	5,343
Gross Domestic Product (in USD billions)	639.7
Average Walk Score ³	90/100
Annual Rainfall (mm/year)	639.7
Climate Action Plan	Yes (National)

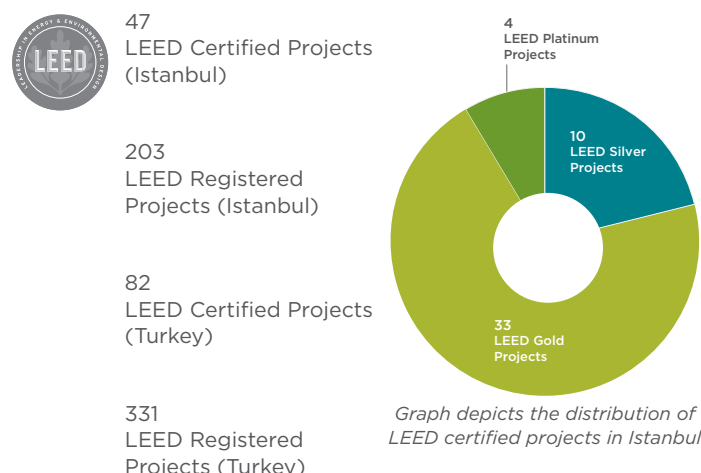
BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁴	37,534,082
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

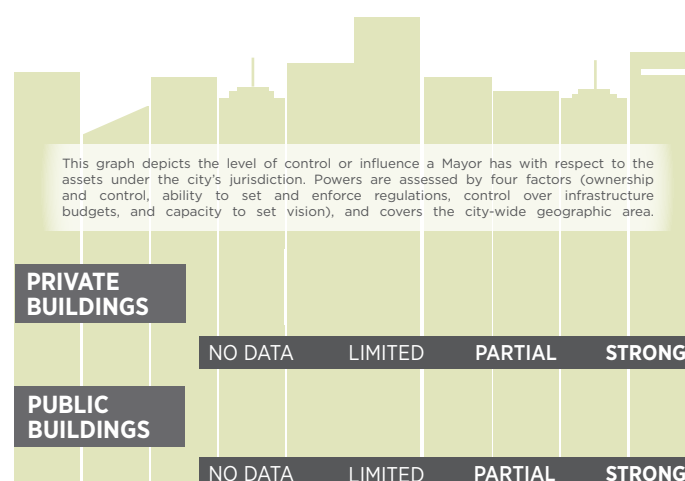
MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Turkey) ⁵	117
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PROJECT BREAKDOWN



MAYORAL POWERS



POLICY SPOTLIGHT:

Turkey's Sustainable Development Report was published in 2012. It aims to assess the actions which Turkey has already undertaken during its sustainable development process, reveal the policies and measures will be useful for Turkey to apply moving forward, and evaluate the possible contribution Turkey can make in solving global problems. Turkey's green growth approach includes intergenerational equity of natural resource utilization, minimization of environmental degradation, utilization of efficient technology, and resource efficiency in production and consumption.⁶

PRIVATE SECTOR INCENTIVES

The Turkish Private Sector Sustainable Energy Finance Facility is a framework operation with up to \$265 million (USD). Under the operation, credit lines will be provided by the European Bank for Reconstruction and Development's Sustainable Energy Initiative to eligible commercial banks for on-lending to private sector borrowers for energy efficiency and small-scale renewable energy investments. Borrowers may be eligible for low-interest loans of up to €5 million to implement energy-saving projects. Eligible measures include, but are not limited to, improvements to building insulation, lighting systems, HVAC systems, boilers, building management systems, power distribution systems, and on-site cogeneration of heat and electricity. Renewable energy investments eligible for loans include small hydropower plants, installations of wind turbines, biomass and biogas systems for energy production, solar systems, and geothermal power and/or heat plants.⁷

GREEN SCHOOLS

Under the Turkish National Climate Change Action Plan, students are engaged in a variety of exercises that highlight the impacts of climate change on natural resources and agriculture. Schools are also being outfitted with modern technology to help curb energy intensity.

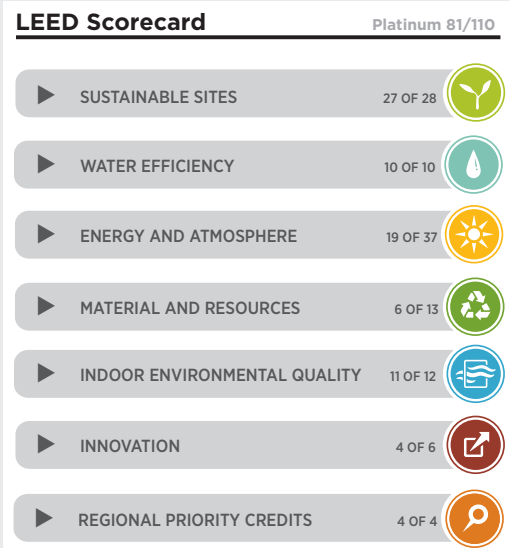
GREEN RESIDENTIAL BUILDINGS

The Istanbul Metropolitan Municipality Housing Project implemented from 1995-2000 by the Istanbul Public Housing Corporation provided 16,000 housing units to low-income families throughout the city. The project focused on improving community connectivity by increasing resident access to basic services within walking distance to help alleviate traffic congestion. Water filtration systems were included to protect local aquifers from contamination and help prevent stormwater runoff. One of the redeveloped units was outfitted with cogeneration technology that produces 25 MW annually. Of the 25 MW installation, 5 MW is dedicated to the housing units and the remainder is sold to utility ratepayers.⁸

PROJECT SPOTLIGHT:

Ronesans Tower Office Building

Ronesans Tower achieved Platinum Certification under the LEED Core and Shell rating system in September 2014. The building's design resulted in a 40% reduction in baseline indoor water use, a 50% reduction in wastewater generation, and a 100% reduction in potable water used for landscaping purposes, all against a modeled baseline. 20% of building materials used were made from recycled content and 20% of materials used were extracted, harvested, recovered, or manufactured within a 500 mile radius of the project site. Additionally, construction and demolition debris associated with the project was diverted from landfills at a rate of 75%.⁹



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GREEN BUILDING CITY MARKET BRIEF

LONDON

UNITED KINGDOM



A CITY-WIDE MOVEMENT

In 2013, the Greater London Authority (GLA) launched PAS2070, a specification providing a robust and transparent method for consistent, comparable, and relevant quantification, attribution, and reporting of direct and indirect city-scale greenhouse gas emissions. It expands the scope of what is traditionally measured by cities in greenhouse gas inventories to consider consumption based emissions.¹

LEADING BY EXAMPLE

London aims to lead the way in making the most of the global low carbon economy. Preliminary studies into the opportunities presented by investment in low carbon infrastructure have suggested that London could gain £3.7 billion of investment growth annually up to 2025. At present, the **green economy in London is worth £25.4 billion**, just over 5% of London's total economic worth of £476.2 billion, and it is expected to continue to grow. **London's green economy provides employment for approximately 164,000 people.** Additionally, in partnership with Siemens, the Mayor's Low Carbon Prize seeks innovative ideas from London's students to help reach the city's carbon reduction target. The winner receives £20,000 in funding to help develop their idea to market level.²

GREEN AFFORDABLE HOUSING

The London Housing Strategy sets minimum sustainability requirements for publicly-funded, homes and gives priorities to developments that achieve higher levels of the Code for Sustainable Homes.

CITY EMISSIONS TARGET:

The city of London aims to reduce carbon dioxide emissions by 60% by 2050, compared with 1990 levels. The city has set midterm reduction goals of 20% by 2015, 25% by 2020 and 30% by 2025.³

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	7.8 million
Land Area (km ²)	1,572
Gross Domestic Product (in USD billions)	731.2
Average Walk Score ⁴	95/100
Annual Rainfall (mm/year)	770
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁵	44,300,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (United Kingdom) ⁶	573
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PROJECT BREAKDOWN

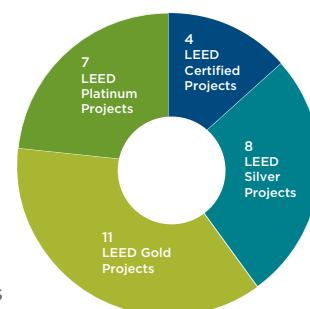


30
LEED Certified
Projects (London)

48
LEED Registered
Projects (London)

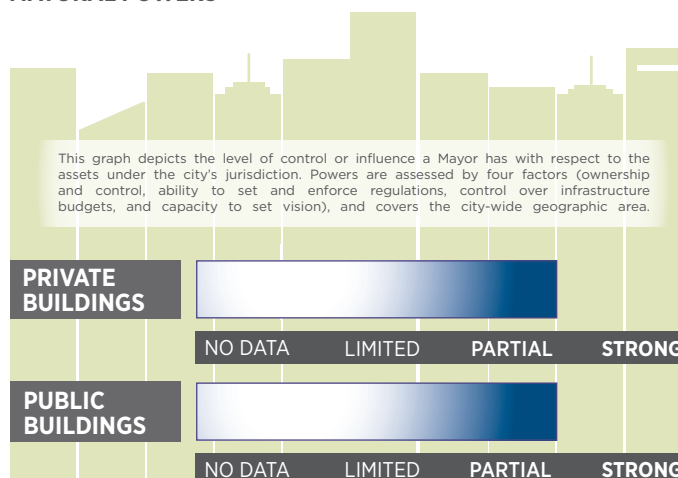
59
LEED Certified Projects
(United Kingdom)

128
LEED Registered Projects
(United Kingdom)



Graph depicts the distribution of LEED certified projects in London

MAYORAL POWERS



POLICY SPOTLIGHT:

The Green Procurement Code is a support service for organizations committed to reducing their environmental impact through responsible purchasing. It provides advice, online resources, performance benchmarking and sharing of best practices.

RETROFIT

London has developed two schemes to retrofit the city's domestic and public buildings. The **RE:NEW program aims to retrofit 1.2 million domestic properties by 2015**. It has brought together all of London's existing homes retrofit programs into one to enable delivery of retrofit solutions to be more efficient and cost effective. RE:NEW works as a partnership between the GLA, various stakeholders, and London's 32 Boroughs.

Around 37% of the city's CO2 emissions come from its homes and the RE:NEW program offers free energy efficiency advice and free installation of simple energy improvements. With the official launch of the Green Deal, the scheme will seek to take advantage of this to fund more energy efficiency measures in homes such as solid wall, cavity, and loft insulation. This service is provided with no upfront cost and provided free or at a subsidized rate for those unable to pay.

The scheme applies to all types of homes including owner occupied, privately rented, and social housing, and is area based. "Area based" means that each of the boroughs has at least one RE:NEW area to prevent a reduction in uptake that could be caused by an on-demand structure due to neighborhood. However, the scheme has been designed to make sure no residents feel forced to take part.⁷

The RE:FIT program is the public buildings retrofitting scheme was established by the GLA. It supports public sector organizations to retrofit their buildings, reducing their carbon footprint and energy bills. In this way, the **GLA aims to retrofit 11 million square meters of public buildings by 2015**, equating to a reduction in the capital's carbon emissions of over 2.5 million tons per year.

The scheme uses an energy service company (ESCO) to implement energy efficiency measures including insulation and building fabric improvements, replacement and upgrading of monitoring and evaluation equipment and the installation of other measures such as CHP. The ESCo guarantees the level of energy savings and so secures the financial savings.⁸

SUSTAINABLE COMMUNITIES

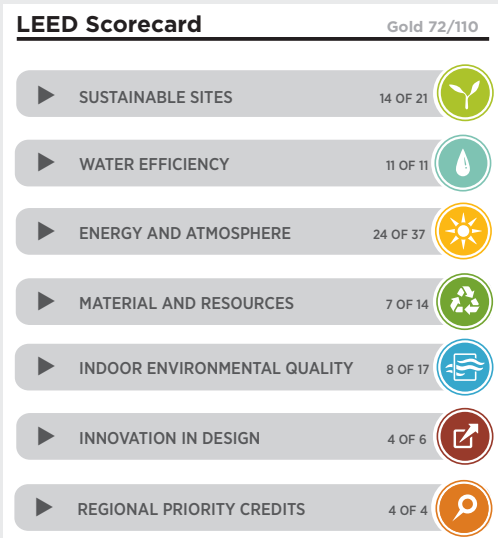
The RE:CONNECT program promotes a local approach to reducing carbon emissions. **The first Green Enterprise District will be created in East London and the GLA has supported the creation of up to 10 Low Carbon Zones across London**. These will provide much needed support to businesses and Londoners to reduce carbon and address skills shortages. Additionally, the London Development Agency is putting together a proposal for a virtual Retrofit Academy which will also help provide education and training to encourage the transition to a low carbon economy.

Finally, the Decentralized Energy for London Program aims to deliver 25% of the city's energy supply through decentralized means by 2025. The program will provide London boroughs and other project sponsors with technical, financial, and commercial assistance to develop and bring decentralized energy projects to market.

PROJECT SPOTLIGHT:

Bloomberg Park House

Bloomberg Park House achieved Gold certification under the LEED for Commercial Interiors rating system in June 2012. Construction and demolition debris associated with the project was diverted from landfills at a rate of 75%. The building's design resulted in a 40% reduction in indoor potable water use and a 25% reduction in lighting power density, both against a modeled baseline.⁹



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GREEN BUILDING CITY MARKET BRIEF

MADRID

SPAIN



A CITY-WIDE MOVEMENT

The Madrid Rio Project originated when a stretch of highway along the Manzanares River was moved underground, resulting in a vast amount of new open space. The newly vegetated, open space has become an integral part of the city. It offers a wide range of attractions such as sport, leisure and cultural facilities. The redeveloped area covers nearly 650 hectares across six districts in Madrid, and over 25,000 trees were planted as part of the project. Walkways were constructed to reconnect the neighborhoods that were disrupted by the original construction of the roadway.¹

LEADING BY EXAMPLE

Included in the Energy and Climate Change Plan is a set of initiatives to implement energy saving and efficiency measures in municipal buildings and facilities, including energy audits, certification, or energy performance contracts.

The estimated public municipal expenditure until 2016 on the measures included in the Energy and Climate Change Plan Horizon 2020 amounts to €123 million. The investment objectives are to ensure quality services to citizens, ensure efficient facilities and performance contracting, and to save energy and money. The city expects to achieve a reduction of at least 20% in energy intensity. Energy performance is monitored through energy audits to determine if implemented measures are effective. Other facets of the initiative will be monitored using quality indicators.²

GREEN BUILDING CERTIFICATION

In new urban developments, green building certification either by either the LEED or BREEAM systems is considered in the Energy and Climate Change Plan to be a useful tool to curb energy intensity. As an example, the new development in the La Rosilla neighbourhood, located on the southeasterly side from the city center, included sustainability criteria from the initial planning stages, and is applying a sustainability evaluation and certification method (BREEAM) to improve, measure, and certify sustainability in the proposed development.

CITY EMISSIONS TARGET:

Madrid aims to achieve a CO₂ reduction of 35% by 2020 compared with 2005 emission levels.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✗
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	3.2 million
Land Area (km ²)	607
Gross Domestic Product (in USD billions)	125
Average Walk Score ³	97/100
Annual Rainfall (mm/year)	436
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁴	11,980,000
% of Emissions from the Building Sector	55.3%
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Spain) ⁵	257
--	-----

PROJECT BREAKDOWN

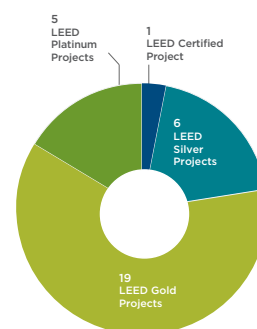


31
LEED Certified Projects
(Madrid)

50
LEED Registered
Projects (Madrid)

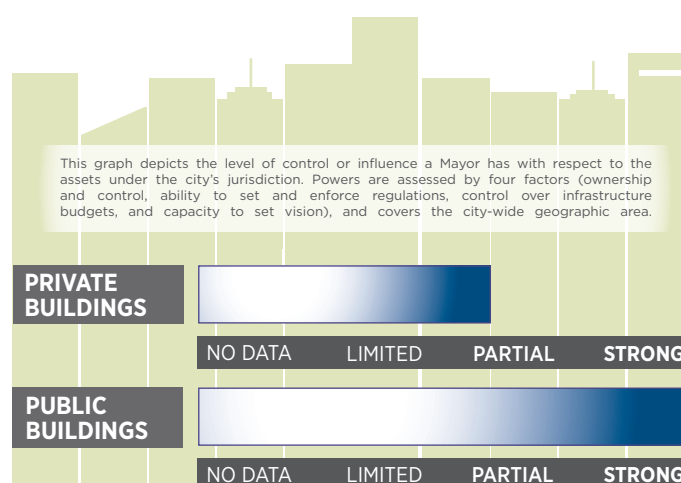
88
LEED Certified Projects
(Spain)

17
LEED Registered
Projects (Spain)



Graph depicts the distribution of LEED certified projects in Madrid

MAYORAL POWERS



POLICY SPOTLIGHT:

Madrid's Plan for Sustainable Use of Energy and Climate Change Prevention aims to reduce greenhouse gas emissions in the Spanish capital by 35% by 2020, compared to 2005 emission levels. The plan consists of policies and initiatives in the transportation, building, waste management and industrial sectors. It also includes a chapter addressing Climate Change Adaptation, with a set of measures to minimise impacts on water resources, green areas, human health, and buildings.⁶

PRIVATE SECTOR INCENTIVES

The city of Madrid has allocated € 1.9 million in the 2014 and 2015 budgets to subsidize energy efficient retrofitting projects in three neighbourhoods (Lavapiés, San Cristobal de los Ángeles, and Ciudad de los Ángeles).⁷

SUSTAINABLE COMMUNITIES

Madrid together with COPADE (NGO dedicated to fair trade) participates in the European Sustainable Tropical Timber Coalition (European STTC), whose ambition is to accelerate demand for certified or licensed timber from sustainably managed tropical forests. Madrid has already started developing its action plan, working on a diagnosis for the tropical timber procurement issue, and on dissemination and education activities in collaboration with local consumers associations and professionals responsible for sustainable timber procurement within their organization.

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PROJECT SPOTLIGHT:



Photo courtesy of Flickr Creative Commons user Zong Reiro

Repsol Campus

Madrid's Repsol Campus achieved Platinum Certification under the LEED for New Construction 2.2 rating system in July 2013. The building generates 12% of its power on-site through renewable energy sources, and 35% of its power is supplied by renewable sources through a green power purchase agreement. The project's design resulted in a 50% reduction in potable water used for landscaping and a 20% reduction in baseline indoor water use, both against a modeled baseline.⁸

LEED Scorecard

Platinum 53/69

▶ SUSTAINABLE SITES	13 OF 14	
▶ WATER EFFICIENCY	4 OF 5	
▶ ENERGY AND ATMOSPHERE	17 OF 17	
▶ MATERIAL AND RESOURCES	6 OF 13	
▶ INDOOR ENVIRONMENTAL QUALITY	8 OF 15	
▶ INNOVATION IN DESIGN	5 OF 5	

GREEN BUILDING CITY MARKET BRIEF

MILAN

ITALY



A NATIONAL MOVEMENT

The Environmental Action Strategy for Sustainable Development in Italy seeks to improve the quality of life in the urban environment through a number of strategies. It targets both indoor and outdoor air quality, several types of pollution, food security, environmental crime, citizen health, and the exploitation of natural resources along with many other focus areas. The strategy specifically targets buildings by:

- Requiring automatic temperature regulation and control devices be installed in all public buildings
- Implementing an incentive scheme for older buildings within seismic hazardous areas to improve their resiliency
- Promoting sustainable construction techniques that result in energy and material savings, appropriate sanitary conditions, and a qualitative improvement of buildings
- Initiating the monitoring of building efficiency
- Providing fiscal measures for upgrading facilities¹

LEADING BY EXAMPLE

Under the Sustainable Energy Action Plan (SEAP), retrofitting of existing buildings and increasing energy efficiency in new buildings represent fundamental intervention strategies. The plan targets buildings in both the private and public sectors.²

To reach this goal, strategies including HVAC systems renovation, thermal insulation, windows substitution, and solar photovoltaic panels installation will be implemented. Capacity building programs will also take place across the municipal sector to encourage city employees to alter their behaviors in order to use energy more efficiently.

GREEN CODES

Milan's updated building code, approved by the City Council in October 2014, sets minimum energy performance and sustainability criteria stricter than limits set by current national and regional legislation. Incentives are offered in the form of increased gross floor area for buildings satisfying more restrictive requirements.

CITY EMISSIONS TARGET:

Milan aims to achieve a 20% reduction in emissions by 2020, compared with 2005 emissions levels.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	1.35 million
Land Area (km ²)	182
Gross Domestic Product (in USD billions)	--
Average Walk Score ³	98/100
Annual Rainfall (mm/year)	920
Climate Action Plan	In progress

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁴	6,300,000
% of Emissions from the Building Sector	40%
Municipal Emissions (metric tons CO ₂ e)	129,000

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Italy) ⁵	263
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PROJECT BREAKDOWN

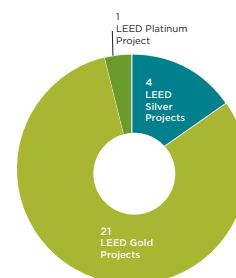


26
LEED Certified
Projects (Milan)

50
LEED Registered
Projects (Milan)

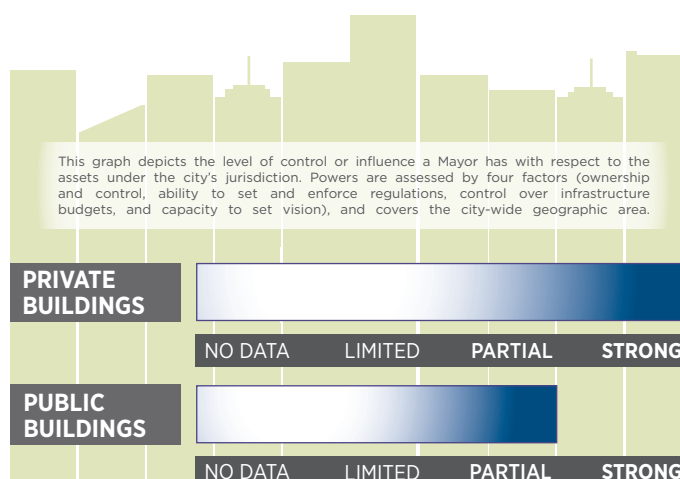
89
LEED Certified
Projects (Italy)

169
LEED Registered
Projects (Italy)



Graph depicts the distribution of LEED certified projects in Milan

MAYORAL POWERS



POLICY SPOTLIGHT:

Milan's SEAP will seek to reduce greenhouse gas emissions across the transportation, residential, service, public, and energy sectors. The plan includes measures aimed to increase city sustainability such as retrofitting lighting systems to more efficient LED systems, improving the energy efficiency in new and existing buildings in all sectors, improving public transport, and promoting sustainable mobility (cycling, walking and sharing systems).

PRIVATE SECTOR INCENTIVES

Italy offers tax incentives for energy efficiency improvements to residential and commercial existing properties for retrofit measures such as thermal insulation, installation of solar panels, the replacement of heating and air-conditioning systems, and other energy conservation strategies. Tax credits can cover up to 55% of the related costs, not to exceed a maximum value that is determined by type of measure taken, for instance, the maximum incentive for thermal insulation is capped at USD\$83,658.⁶

SUSTAINABLE COMMUNITIES

In order to reduce vehicle congestion and the resulting emissions in its city center, Milan initiated a limited traffic zone called Area C. Cars entering the designated area are detected by a system of electronic gates and charged €5 per entry. Milan residents have 40 free entrances to Area C each year, and are charged €2 for all subsequent entrances. Exempt vehicles include mopeds, motorcycles, electric cars, and vehicles for disabled citizens. Thus far, Area C has experienced a 28% decrease in road congestion, demand for on-street parking has been reduced by 10%, freight delivery productivity is up by 10%, CO2 emissions in the area are down 35%, and the speed of public transportation in the area has increased on buses by 7% and on the tram by 4%.⁷

PROJECT SPOTLIGHT:

Varesine High-Rise Commercial

Hines Real Estate's Milan Varesine high-rise commercial building achieved Gold certification under the LEED Core and Shell rating system in June 2014. The building's design resulted in a 14% improvement on a modeled baseline for building energy performance. Half of the wood products used in construction were certified sustainable by the Forest Stewardship Council.⁸

LEED Scorecard

Gold 40/62

▶ SUSTAINABLE SITES	10 OF 15	
▶ WATER EFFICIENCY	4 OF 5	
▶ ENERGY AND ATMOSPHERE	6 OF 14	
▶ MATERIAL AND RESOURCES	7 OF 11	
▶ INDOOR ENVIRONMENTAL QUALITY	8 OF 12	
▶ INNOVATION IN DESIGN	5 OF 5	

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GREEN BUILDING CITY MARKET BRIEF

MOSCOW

RUSSIA



CITY-WIDE MOVEMENT

The Standards and Labels for Promoting Energy Efficiency in Russia pilot program is underway in the Moscow area and is intended to facilitate wide-scale market transformation towards sustainability. The program, executed by the Ministry of Education and Science of the Russian Federation in partnership with the United Nations Development Programme, will promote energy efficiency by:

- Developing energy efficiency standard and label (S&L) schemes and public procurement models
- Building local verification and enforcement capacity
- Supporting the establishment of state-of-the-art compliance checking and certification systems
- Constructing infrastructure in accordance with international best practices
- Raising awareness among commercial and residential consumers regarding energy efficient appliances and systems¹

LEADING BY EXAMPLE

Through the new federal standard, municipalities like Moscow are required to list energy efficiency target parameters each year. Parameters include volume of energy consumption per unit of regional GDP, shares and consumption of different kinds of energy calculated by meters, shares and volumes of energy produced by renewable energy sources, and savings on energy and water. The targets are to be spread out across all building sectors, including residential.²

GREEN CODES

In 2009, Federal Law No. 261-FZ was enacted, establishing standards for regulating energy consumption to encourage energy savings. For example, the law restricts the sale of incandescent light bulbs, introduces the requirement to provide energy efficiency information on product labels, establishes guidelines on mandatory commercial inventories of energy resources, creates standards on energy efficiency of new buildings, and sets energy reduction goals. The law also requires an energy audits and metering for all public buildings and establishes that public agencies must reduce their energy and water consumption by 15% by year's end 2014.

EMISSIONS TARGET:

Moscow aims to achieve a 20% reduction in greenhouse gas emissions by 2020, compared with 2009 emissions.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✗

CITY DETAILS

Population	12.1 million
Land Area (km ²)	2,511
Gross Domestic Product (in USD billions)	520.1
Average Walk Score ³	92/100
Annual Rainfall (mm/year)	1,015
Climate Action Plan	In Progress

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁴	44,600,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Russia) ⁵	33
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PROJECT BREAKDOWN



5
LEED Certified Projects (Moscow)

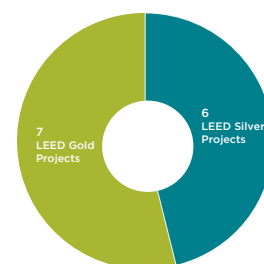
35
LEED Registered Projects (Moscow)

13 LEED Certified Projects
(Russia)

71
LEED Registered Projects (Russia)

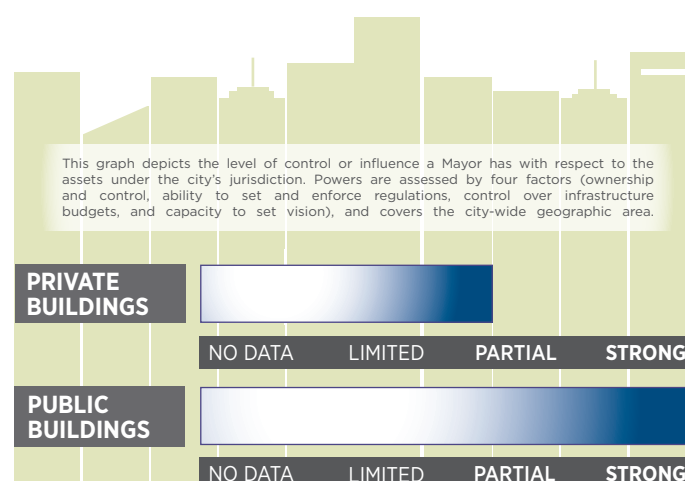
8
BREEAM Certified Projects
(Moscow)

22
BREEAM Registered Projects
(Moscow)



Graph depicts the distribution of LEED certified projects in Russia

MAYORAL POWERS



POLICY SPOTLIGHT:

In 2011, the Federal Government approved an energy saving program for Moscow to run until 2020. Its goal is to reduce energy intensity by no less than 40% by 2020, compared to 2007. This goal is in line with the national target of a 40% reduction per unit of GDP by 2020, compared with 2007 levels. The program targets 40,000 residential houses and 75 nonresidential buildings. Roughly \$6.5 billion USD has been allocated for implementation of the program from both the city and national governments.⁶

ENERGY CONSERVATION

The city of Moscow Government's Energy Conservation Strategy intends to ensure more efficient use of energy resources by city consumers through a reduction in energy losses during production, conversion, transport and end use. Targeted outcomes include:

- A reduction of energy intensity of gross regional product from 41 kg to 34 kg of reference fuel per 10,000 roubles (in 2007 prices)
- Gross electricity savings from 1,153 mln to 1,048.55 mln kWh (cumulative)
- Gross heating energy savings from 1.58 mln to 1.41 mln Gcal (cumulative)
- Gross natural gas savings from 449.24 to 181.86 mln m³ (cumulative)
- Gross water savings from 111.06 to 23.34 mln m³

GREEN BUILDING MARKET

An increasing number of buildings of various types ranging from commercial offices and interiors to large-scale complexes have been assessed to LEED & BREEAM standards. The opening of the Green Building Council Russia, a member of the World Green Building Council (WGBC) in 2009 has stimulated the industry with numerous events, trainings and other projects.

PRIVATE SECTOR INCENTIVES

Russian taxpayers are entitled to a 3-year exemption on corporate property tax for newly introduced energy efficient systems such as air conditioners, elevators and computer technology. Investments in energy efficient equipment can also qualify for accelerated depreciation at twice the standard rate for profits tax purposes.⁷

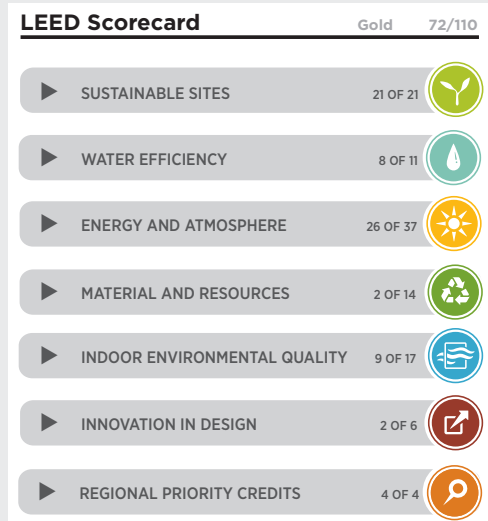
GREEN RESIDENTIAL BUILDINGS

The Russia Residential Energy Efficiency Project was initiated in 2010 by the Ministry of Employment and the Economy in collaboration with the International Finance Corporation. It aims to stimulate investment in the energy efficient renovation of residential multifamily buildings in order to reduce that nation's greenhouse gas emissions. The project is expected to cut Co2 emissions by 2.5 million tons by its end in 2015.⁸

PROJECT SPOTLIGHT:

Siemens Russia Headquarters

Siemens Russian Headquarters, located in Moscow, achieved Gold Certification under the LEED for Commercial Interiors rating system in March 2012. The building's design resulted in a 20% reduction in lighting power density and a 35% reduction in indoor potable water usage, both against a modeled baseline. Construction and demolition debris associated with the project were diverted from landfills at a 50% rate.⁹



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GREEN BUILDING CITY MARKET BRIEF

OSLO

NORWAY

**A CITY-WIDE MOVEMENT**

By introducing an innovative and energy-efficient system of street lighting, the city of Oslo can reduce its energy consumption in street lighting between 40 and 70%. Almost one out of five street lamps are now energy efficient and dynamic. Carbon emissions could be reduced by approximately 7,000 tons annually if all street lamps in Oslo were energy efficient. The costs for retrofitting the first 10,000 street lights was €12 million.¹

LEADING BY EXAMPLE

As part of the Oslo's comprehensive plan to reduce energy consumption, beginning January 1, 2014, new municipal buildings must comply with Passive House or an equivalent standard. By 2015, municipal buildings that are rented in the private market, must comply with prescribed low energy standards, and by 2020, all municipal buildings must comply with Passive House standards or an equivalent.²

PRIVATE SECTOR INCENTIVES

In 1982, the city of Oslo established the Ekon Fund, developed by applying a surcharge on each kWh sold in the city, for the purpose of providing and facilitating capital to be used for energy conservation measures in the private sector.³ Since its inception, the fund has contributed to an estimated 2,528 GWh of energy savings. It has also lead to the production of over 1 TWh of renewable energy annually.

GREEN RESIDENTIAL BUILDINGS

Under Oslo's Urban Ecology Program, residential developments must be built to prioritize density and proximity to public transportation nodes. The program stresses that green spaces hold precedence over densification. Oslo encourages developers to calculate carbon footprints when planning major projects.

CITY EMISSIONS TARGET:

The city of Oslo aims to reduce its greenhouse gas emissions by 50% by 2030, relative to 1991 levels, and to be climate neutral by 2050.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✗
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	630,000
Land Area (km ²)	454
Gross Domestic Product (in USD billions)	67.7
Average Walk Score ⁴	93/100
Annual Rainfall (mm/year)	763
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁵	2,340,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

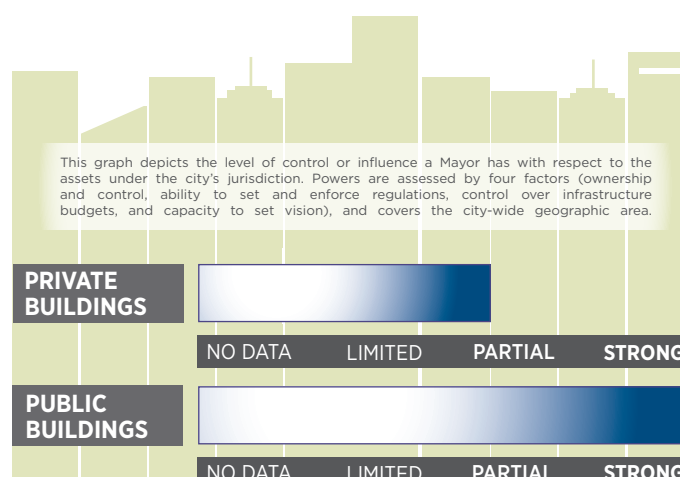
LEED Credentialed Professionals (Norway) ⁶	12
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PROJECT BREAKDOWN

- 3 LEED Certified Projects (Oslo)
- 1 LEED Registered Projects (Oslo)
- 4 LEED Certified Projects (Norway)
- 2 LEED Registered Projects (Norway)



Graph depicts the distribution of LEED certified projects in Norway

MAYORAL POWERS

POLICY SPOTLIGHT:

On March 23, 2011, the City Council of Oslo adopted the Urban Ecology Programme 2011-2026 with the intent to establish Oslo as a sustainable urban community. The implementation of the program will result in reduced noise levels, air pollution and greenhouse gas emissions. Part of the initiative includes the development of an eco-efficient transport system, maintaining and strengthening of the city's blue-green areas, efficient waste management, and the development of an eco-efficient city administration.⁷

GREEN SCHOOLS

The University of Oslo has committed to a higher education sustainability initiative with the goal to establish itself as a green university. The initiative aims to promote symmetry between curriculum, research activities, and daily operation with regards to sustainability. To meet this commitment, the university will increase energy efficiency in its buildings and integrate emissions reporting.⁸

SUSTAINABLE COMMUNITIES

In 2006, Oslo developed a waste management strategy with the goal of recycling 50% of all household waste by 2014 (The target year has been extended to 2018). The strategy is based on the waste management hierarchy of waste reduction: re-use of objects, then recycling, incineration with energy recovery, and lastly landfill. In 2013, of the 240,000 tons of household waste collected, 1.5 % was reused, 37.2% recycled, 57.9% incinerated with energy recovery, and only 3.4 % went to a landfill.⁹

PROJECT SPOTLIGHT:

Siemens New Oslo Headquarters

The new Siemens Oslo Headquarters achieved Gold certification under the LEED for New Construction rating system in December 2013. Construction and demolition debris associated with the project was diverted from landfills at a rate of 75%. The building's design resulted in a 48% improvement on a baseline building performance rating and a 35% reduction in baseline indoor water use.¹⁰

LEED Scorecard

Gold 63/110

▶ SUSTAINABLE SITES	19 OF 26	
▶ WATER EFFICIENCY	6 OF 10	
▶ ENERGY AND ATMOSPHERE	22 OF 35	
▶ MATERIAL AND RESOURCES	2 OF 14	
▶ INDOOR ENVIRONMENTAL QUALITY	6 OF 15	
▶ INNOVATION IN DESIGN	4 OF 6	
▶ REGIONAL PRIORITY CREDITS	4 OF 4	

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GREEN BUILDING CITY MARKET BRIEF

PARIS

FRANCE



A CITY-WIDE MOVEMENT

Parisians are being engaged in energy savings through informational campaigns launched as part of the Paris Climate and Energy Action Plan. The campaigns center on ways in which citizens can alter their behavior to save energy and lower greenhouse emissions throughout city's buildings, as well as in its transportation and waste sectors. The plan also intends to promote sustainable consumption amongst city residents.

LEADING BY EXAMPLE

Paris intends to set the standard for building efficiency within its own building stock. Under the Paris Climate and Energy Action Plan, the city will conduct thermal audits of all public facilities and will develop a plan to renovate its building stock through measures: including thermal renovation, updating of HVAC equipment, energy-efficient measures, enhancing street lighting, and increasing the share of renewable energy production and consumption. Paris expects to achieve a 30% reduction in greenhouse gas emissions in its city operations by 2020, compared to 2004 levels.¹

PRIVATE SECTOR INCENTIVES

On the national level, the French government has implemented a range of financial incentives for new and existing homes in order to encourage energy efficiency and sustainable construction. Newly completed homes, as of 2009, that have achieved a low energy consumption (BBC 2005) label can qualify for a property tax exemption from between 50% and 100%. The label, BBC Effinergie, sets maximum energy consumption levels for residential units at 50 kilowatt-hours per square meter per annum. A sustainable development tax credit is in place to provide tax rebates ranging from 15% to 25%, depending on the type of energy-efficient system purchased and installed, in both new and existing residential units.²

CITY EMISSIONS TARGET:

Paris aims to reduce carbon emissions by 25% by 2020 compared with 2004 emission levels (75% by 2050).

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✓
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	2.3 million
Land Area (km ²)	105
Gross Domestic Product (in USD billions)	800
Average Walk Score ³	100/100
Annual Rainfall (mm/year)	630
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁴	24,600,000
% of Emissions from the Building Sector (2009)	5,760,000
Municipal Emissions (metric tons CO ₂ e) (2004) ⁵	253,000

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (France) ⁶	107
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PROJECT BREAKDOWN

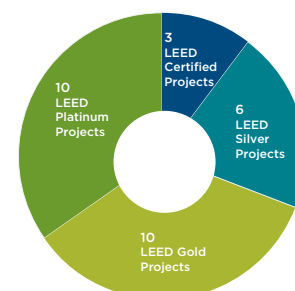


9
LEED Certified
Projects (Paris)

31
LEED Registered
Projects (Paris)

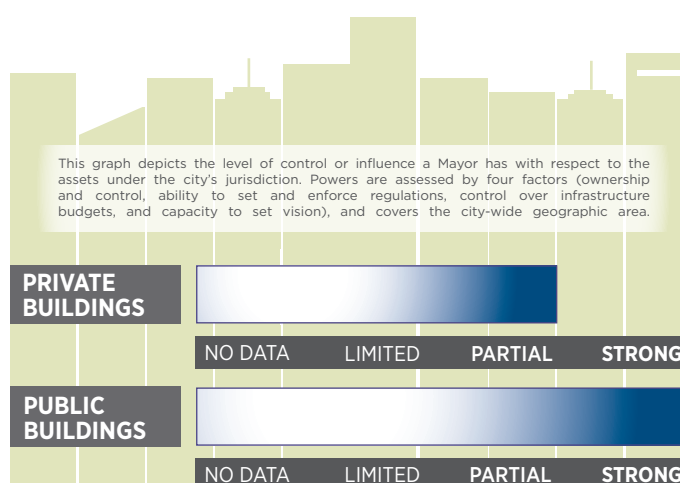
29
LEED Certified
Projects (France)

67
LEED Registered
Projects (France)



Graph depicts the distribution of LEED certified projects in France

MAYORAL POWERS



POLICY SPOTLIGHT:

The Paris Climate and Energy Action Plan was adopted by the city in October 2007, and updated in 2012. The goal of the plan is to reduce greenhouse gas emissions associated with city activities by 75% by 2050 (compared with 2004 levels). The plan targets the city's building stock (public and private) with plans for increased energy efficiency, more efficient energy use and production, and reduction of greenhouse gas emissions from the transportation sector tied to various measurable goals and objectives. One goal of the plan is to require social housing to have a maximum rate of primary energy consumption of no more than 50 kilowatt-hours per square meter per year for new buildings and no more than 80 kilowatt-hours per square meter per year for retrofits. In the past 7 years, 30,000 social housing units underwent energy efficiency retrofits, saving residents approximately €400 per year on their energy costs.

GREEN SCHOOLS

Under the Paris Climate and Energy Action Plan, energy efficiency contracts have been launched in order to spur a massive retrofit program in primary schools and pre-schools with the aim of reducing energy consumption and gas emissions by 30%. Children in these schools will also learn ways in which they can contribute to reducing the cities greenhouse gas emissions. Secondary school students will take part in a program on energy efficiency that includes ways in which they can alter their behavior to save energy, as well as conferences, debates, and visits to buildings to observe features and measures of energy efficient performance.⁷

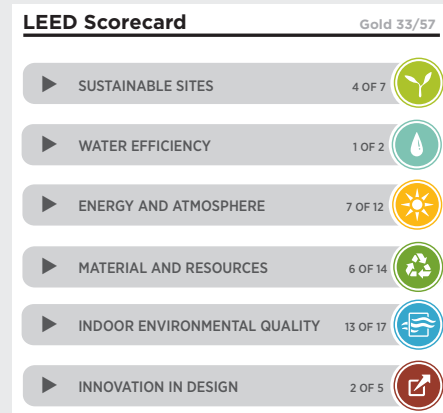
SUSTAINABLE COMMUNITIES

In 2007, Paris instituted a bike-share program called Vélib, in the first three months, 1.75 million subscriptions were sold. The system consists of 20,600 cycles available to rent at over 1,400 terminals throughout the city. Subscriptions are available to anyone over the age of 14 at €1.70 for one day, €8 for a week and starting from €29 for the year. These rates make the system convenient for both tourists and residents in the city, and today Vélib accounts for 40% of trips made by bicycle in Paris. The program has the potential to save 32,330 tons of CO2 annually.⁸

PROJECT SPOTLIGHT:

Nokia Le Parc Du Millenaire

Paris's Nokia Le Parc Du Millenaire achieved Gold certification under the LEED for Commercial Interiors rating system in February 2010. The project's design resulted in a 15% reduction in lighting power density and a 20% reduction in indoor potable water use. 50% of construction and demolition debris associated with the project was diverted from landfills. 10% recycled content building material was used in construction. Also, 40% of the building's existing non-structural elements were reused.⁹



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GREEN BUILDING CITY MARKET BRIEF

ROME

ITALY



A NATIONAL MOVEMENT

The Environmental Action Strategy for Sustainable Development in Italy seeks to improve the quality of life in the urban environment through a number of strategies. It targets both indoor and outdoor air quality, several types of pollution, food security, environmental crime, citizen health, and the exploitation of natural resources - along with many other focus areas. The strategy specifically targets buildings by:

- Requiring automatic temperature regulation and control devices be installed in all public buildings
- Implementing an incentive scheme for older buildings within seismic hazardous areas to improve their resiliency
- Promoting sustainable construction techniques that result in energy and material savings, appropriate sanitary conditions, and a qualitative improvement of buildings
- Initiating the monitoring of building efficiency
- Providing fiscal measures for the upgrading of urban facilities¹

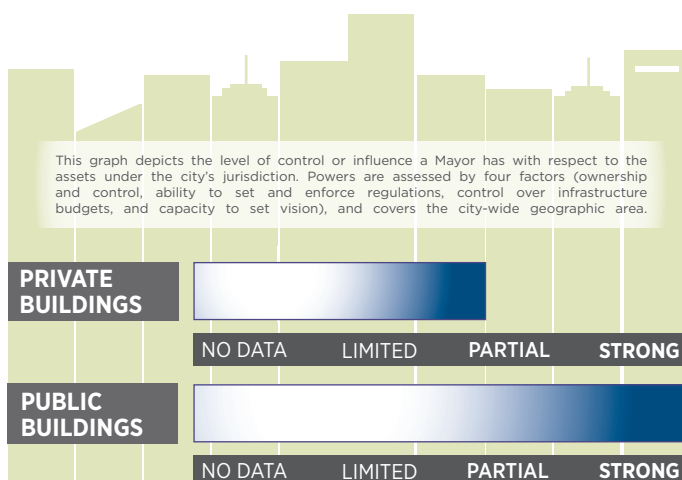
GREEN SCHOOLS

The Province of Roma initiated a program with RomaEnergia, a local utility, called Solar Energy at School. It is intended to provide educational opportunities to students along with installing renewable energy devices in schools.²

CITY EMISSIONS TARGET:

The city of Rome hopes to achieve at minimum, a 20% reduction in greenhouse gas emissions by 2020, compared to 2003 levels.

MAYORAL POWERS



CITY DETAILS

Population	2.7 million
Land Area (km ²)	1,297
Gross Domestic Product (in USD billions)	167.8
Average Walk Score ³	98/100
Annual Rainfall (mm/year)	766
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁴	10,010,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Italy) ⁵	263
--	-----

PROJECT BREAKDOWN

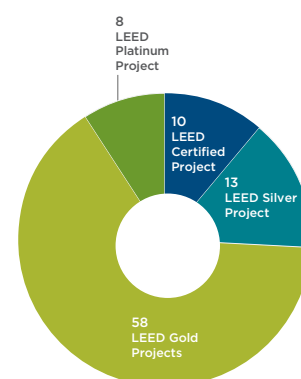


8
LEED Certified
Projects (Rome)

16
LEED Registered
Projects (Rome)

89
LEED Certified
Projects (Italy)

169
LEED Registered
Projects (Italy)



Graph depicts the distribution of LEED certified projects in Rome

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✗

POLICY SPOTLIGHT:

Through the Covenant of Mayors, the city of Rome has instituted a Sustainable Energy Action Plan that details how the city will go about achieving its 2020 emissions reduction target. The plan's targets include: increased energy efficiency in new and existing buildings, increasing renewable energy supply, the protection of green space, implementing a green purchasing policy, along with other strategies that will help Rome meet its goals of increasing citywide sustainability. The city will report progress to the European Commission on a biennial basis.⁶

GREEN SCHOOLS CONTINUED

The Regional Agency for the Management System of Natural Protected Areas in the city of Rome manages an environmental education program consisting of a variety of activities and projects designed to engage young learners on sustainability issues. Annually through the program, more than 13,000 students visit protected natural areas in and around the city to learn the importance of resource conservation and biodiversity. Local farms participate in the program by offering free activities and workshops for students. The program also offers training to teachers.⁷

LEADING BY EXAMPLE

In 2009, with Resolution 269/15, Rome adopted a green procurement policy (GPP). A working group was created within the Office of Sustainable Development to oversee the implementation of the GPP. The GPP lists goals for agencies to meet regarding sustainable purchasing along with acceptable products. Under the policy, training sessions were conducted to educate city employees on the importance of buying green. The policy also affects school buildings. Examples of requirements include:

- Purchasing furniture that is made from recycled materials, recycled wood, or wood from certified sustainably managed forests
- Purchasing 100% recycled paper or paper goods produced by fibers from sustainably managed forests
- Computer purchases must be consistent with European ENERGY STAR® Standards
- Cleaning products used must be labeled sustainable by a recognized third-party⁸

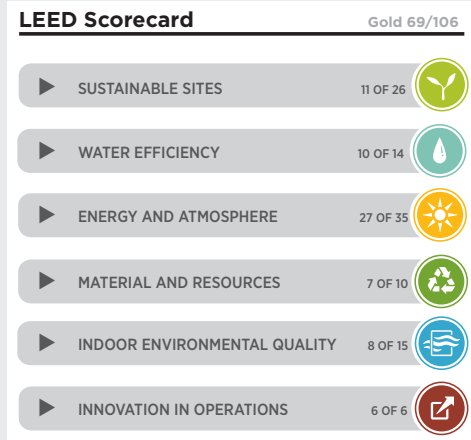
PRIVATE SECTOR INCENTIVES

Italy offers tax incentives for energy efficiency improvements to residential and commercial existing properties for retrofit measures such as thermal insulation, installation of solar panels, the replacement of heating and air-conditioning systems, and other energy conservation strategies. Tax credits can cover up to 55% of the related costs, not to exceed a maximum value that is determined by the type of measure taken. For instance the maximum incentive for thermal insulation is capped at USD\$83,658.⁹

PROJECT SPOTLIGHT:

International Fund for Agriculture Development (IFAD) - Rome Headquarters

IFAD's Rome Headquarters achieved Gold certification under the LEED for Existing Buildings ratings system in August 2010. The building's design resulted in a 25% reduction in indoor potable water use and an 88% reduction in potable water used for landscaping purposes, both against a modeled baseline. Ongoing consumables are reused, recycled, or composted at a rate of 50%. The building also achieved an 85 ENERGY STAR® Performance Rating.¹⁰



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GREEN BUILDING CITY MARKET BRIEF

ROTTERDAM

THE NETHERLANDS



A CITY-WIDE MOVEMENT

Under the Rotterdam Climate Initiative, the city has charged its residents with helping to reach the initiative's overarching goal of halving carbon emissions by 2025, compared to 1990 levels, and creating a climate proof city. Citizens are encouraged to be involved in tree planting and the development of the city's green areas. Energy-savings competitions are held at the street and neighborhood levels to encourage energy efficiency throughout Rotterdam.¹

The Rotterdam Climate Game is a computer game that raises awareness amongst players regarding the factors involved in resilient construction and sustainable development - both inside and outside of the city of Rotterdam. During gameplay, players will have the ability to weigh sustainability measures against each other to determine the best option. The game features budget considerations such as financial feasibility and grant applications.²

LEADING BY EXAMPLE

The Rotterdam Green Buildings Program, developed as part of the city's climate initiative, consists of measuring energy and water efficiency in municipal buildings. Under the Rotterdam Climate Initiative, the city administration will: plant 4,000 trees, increase energy efficiency in street lighting systems, construct water plazas to hold excess water during extreme weather events for the purpose of alleviating stormwater runoff, make the city's vehicle fleet more sustainable by incorporating hybrid and electric technology, and facilitate urban farming initiatives.³

PRIVATE SECTOR INCENTIVES

To stimulate the installation of green roofs across the city, Rotterdam awards a €25 per square meter subsidy for the installation of a green roof.⁴

CITY EMISSIONS TARGET:

Through the Rotterdam Climate Initiative, the city aims to reduce its carbon emissions by 50% by 2025 compared to 1990 emission levels.⁵

CITY-LEVEL POLICIES PRESENT

Green Building Codes	X
Energy Benchmarking and Data Transparency	X
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	X

CITY DETAILS

Population	600,000
Land Area (km ²)	319
Gross Domestic Product (in USD billions)	322.3
Average Walk Score ⁶	95/100
Annual Rainfall (mm/year)	668
838Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁷	29,460,980
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (The Netherlands) ⁸	33
--	----

PROJECT BREAKDOWN

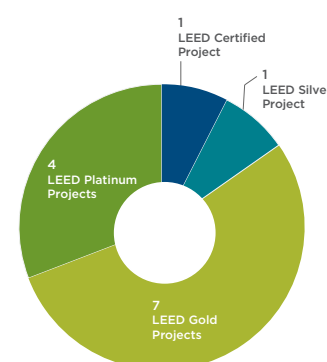


1
LEED Certified
Projects (Rotterdam)

0
LEED Registered
Projects (Rotterdam)

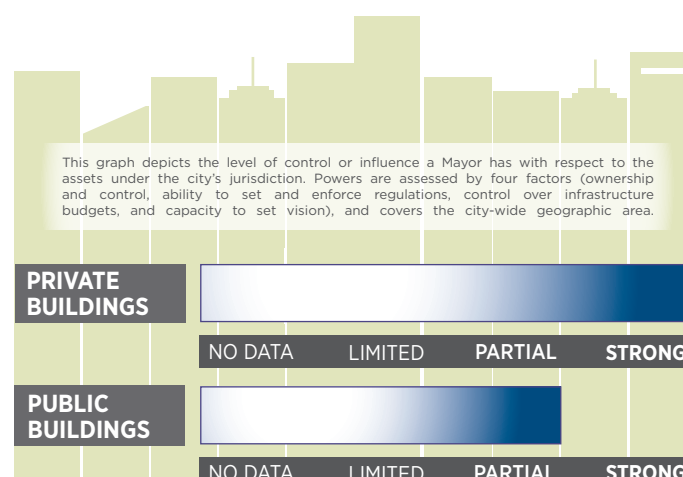
13
LEED Certified Projects
(The Netherlands)

22
LEED Registered Projects
(The Netherlands)



Graph depicts the distribution of LEED certified projects in the Netherlands

MAYORAL POWERS



POLICY SPOTLIGHT:

The Rotterdam Climate Initiative centers around ten sustainability tasks for the city to complete by the program's end date (2014). Each task consists of strategies and measures to be implemented. Building specific schemes include:

- Stimulating green roofs and green façades
- Exploring the implementation of renewable energy devices on commercial buildings
- Achieving a 10% reduction in CO₂ emissions in the housing sector by 2014
- Implementing the Rotterdam Green Building Programme
- Stimulating adaptive building
- Assisting with energy savings in low-income households⁹

GREEN SCHOOLS

The Fresh Air in Schools Program, developed under the Rotterdam Climate Initiative, includes activities and measures to improve the indoor air quality and energy efficiency in schools throughout the city. School curricula will be adjusted to develop a learning trajectory for students focused on climate and energy matters. The climate initiative seeks to establish joint sustainability ventures between the Rotterdam business community, local universities, and vocational colleges.

SUSTAINABLE COMMUNITIES

On July 16, 2008, Rotterdam business leaders and the city government signed a cooperation agreement entitled: Sustainable Development in Rotterdam. The agreement, revised in 2010, places emphasis on changes in the real estate industry, in both new and existing buildings, intended to create a greener and more sustainable Rotterdam.¹⁰

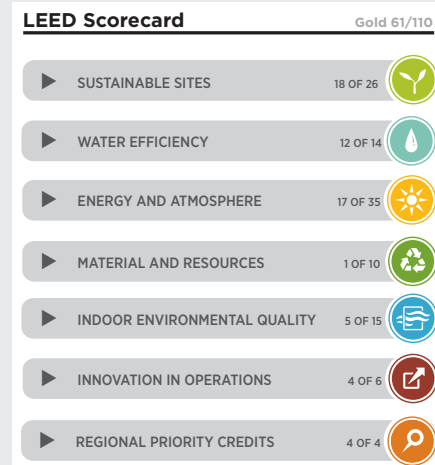
The Rotterdam Climate Initiative targets community sustainability by including the following action points:

- Construction of new cycle paths
- Stimulating smart grid installations
- Creating charging networks for electric vehicles
- Implementing dynamic traffic management systems
- Constructing water plazas
- Increasing energy savings in street lighting

PROJECT SPOTLIGHT:

Pull and Bear Lijnbaan

Pull and Bear's Rotterdam location achieved Platinum certification under LEED for Commercial Interiors in April, 2012. The store consumes 30% less energy and 40% less water compared to the average annual consumption of a conventional store of similar size.¹¹



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GREEN BUILDING CITY MARKET BRIEF

STOCKHOLM

SWEDEN



LEADING BY EXAMPLE

Sweden is a global leader in aggressive and ambitious sustainability policies. In 2009, Sweden passed the “Integrated Climate and Energy Policy,” setting a goal to increase energy efficiency in buildings by 20% by 2020 and by 50% by 2050. Complementary to these energy efficiency targets, Sweden is working to achieve zero-net greenhouse gas emissions by 2050. To meet these targets, Sweden has implemented stringent energy requirements for new construction and renovations under the country’s building code.¹

Sweden has a net-zero energy target for all public buildings by 2019 and all public and commercial buildings by 2021.²

The city of Stockholm builds upon these national ambitions through innovative policy interventions. Stockholm’s **co-generation district energy systems for combined heat and power currently meet 80% of the total heating demand for all buildings in the city**, with 86% of the fuel mix from non-fossil sources.

As a C40 Climate Leadership Group member city, Stockholm is actively building its future based on the vision and strategies in Stockholm’s city plan, “The Walkable City,” and the Roadmap 2050, detailing how Stockholm can become fossil fuel-free.

GREEN BUILDING POLICIES

Through the Stockholm Environment Programme 2012-2015, Stockholm will reduce energy use in city operations by a minimum of 10%. New buildings on land designated by the city shall have an energy intensity of no greater than 55 kWh/m², compared with the national standard 90 kWh/m².

CITY EMISSIONS TARGET:

The city of Stockholm aims to decrease its CO₂ emissions per capita from energy use by 43% below 1990 levels by the year 2015 and become fossil fuel free by 2050. Additionally, the city aims to halve the energy use within buildings by 2050, based on a 1995 baseline.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	905,200
Land Area (km ²)	188
Gross Domestic Product (in USD billions)	133.6
Average Walk Score ³	98/100
Annual Rainfall (mm/year)	539
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁴	2,742,000
% of Emissions from the Building Sector	41%
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Sweden) ⁵	55
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PROJECT BREAKDOWN

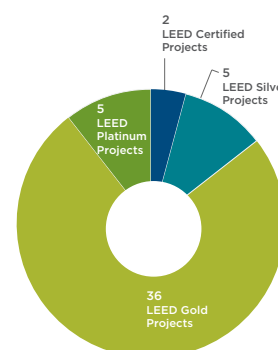


48
LEED Certified Projects
(Stockholm)

20
LEED Registered
Projects (Stockholm)

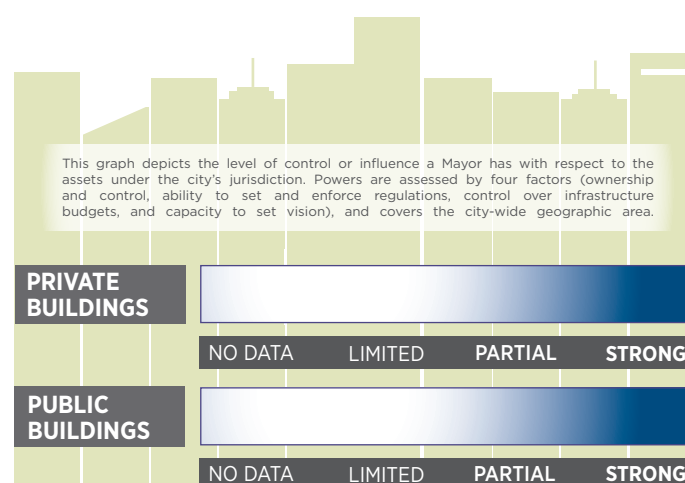
117
LEED Certified Projects
(Sweden)

73
LEED Registered
Projects (Sweden)



Graph depicts the distribution of LEED certified projects in Stockholm

MAYORAL POWERS



POLICY SPOTLIGHT:

The Stockholm Environment Programme

The Stockholm Environment Programme sets a four year agenda for achieving the city's sustainability goals. The 2012-2015 programme has six thematic priorities: Environmentally Efficient Transport, Goods and Buildings Free of Dangerous Substances, Sustainable Use of Energy, Sustainable Use of Land and Water, Environmentally Efficient Waste Management, and a Healthy Indoor Environment.

In 2010, the city of Stockholm was awarded **Europe's first Green Capitol** distinction by the European Commission for its effective measures to reduce noise pollution, efforts to improve water quality, demonstrated leadership in urban development, and access to green areas, among many other metrics.⁶

SUSTAINABLE BUILDING

In 2022, the population of Stockholm will reach one million people. Due to its strong population growth, the city of Stockholm needs to plan for 140,000 additional housing units, along with the accompanying services, infrastructure, and work places. Densification and urban transformation are being prioritized as the city seeks to meet the needs of dynamic urban environments while preserving the city's legendary beauty and character. Currently there are over 100 active and planned construction projects in and around the city—all with a strong focus on sustainability.

The Stockholm City Hall (Stadshuset) was the first building in Sweden to achieve BREEAM In-Use certification.

SUSTAINABLE URBAN DEVELOPMENT

The city of Stockholm is a founding member of the **Sustainability Certification of Urban Areas project** ("Hållbarhetscertifiering av stadsdelar" (HCS). The HCS project is managed by the Sweden Green Building Council and involves 46 stakeholders, including municipalities, private developers, real estate owners, utility companies, architects, consultants, universities, and research institutions. The city of Stockholm, in collaboration with nine other Swedish cities and the Sweden Green Building Council, are **developing a Nordic sustainable urban development framework**, which is to include the vision, goals and indicators for its implementation. Within the HCS project, the city of Stockholm has been involved in the adaptation of BREEAM Communities to Swedish conditions. The Swedish manual will be complete in the near future.⁷

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7. Delegation for Sustainable Cities: Sustainable Urban Development Projects: <http://www.hallbarastader.gov.se/Uploads/Files/804.pdf>.
8. City of Stockholm: Stockholm Royal Seaport Innovation: <http://www.stockholmroyalseaport.com/en/>.

PROJECT SPOTLIGHT:

Stockholm Royal Seaport

The Stockholm Royal Seaport is a sustainable city district, showcasing innovative urban development solutions for buildings, energy, waste, transportation, and technologies. The district is designed to accommodate effects of future climate change, through the employment of **resilient design and development strategies**. The Seaport also promotes sustainable lifestyles through educational efforts that encourage behavioral changes.

One of the project's overarching goals is to dramatically reduce carbon emissions, aiming to be completely fossil fuel free by 2030.

To achieve this goal, the Stockholm Royal Seaport is working with the Clinton Climate Initiative and the C40 Cities Climate Leadership Group's Climate Positive Development Program to identify appropriate strategies to assess the viability of low carbon technologies to reduce emission levels.⁸

Strategies contributing to this goal include: **locally-produced electricity from renewable sources, combined heat and power (CHP) co-generation from biofuels, smart grids and metering, energy efficient building techniques, bicycle parking, and charging stations for electric vehicles.**

GrowSmarter Project

The *GrowSmarter* project introduces 12 Smart Solutions to meet the three pillars of sustainability: economic, social, and environmental. The solutions will be tested in 3 different city areas – representative of many European cities; Stockholm, Cologne, and Barcelona. The pilot cities will together, with industry partners, implement and validate 12 Smart Solutions regarding their energy efficiency, greenhouse gas saving capacity, economic viability, and economic impact. These solutions are in line with the city's urban strategies and plans. The project hopes to achieve the following results:

- Improve the lives of European citizens through building retrofits, improved urban transport, and smart lighting.
- Reduce environmental impact through a 60% reduction in energy intensity and a 60% reduction in transportation emissions.
- Create sustainable development by choosing life-cycle cost-efficient solutions.

GREEN BUILDING CITY MARKET BRIEF

VENICE

ITALY



A NATIONAL MOVEMENT

The Environmental Action Strategy for Sustainable Development in Italy seeks to improve the quality of life in the urban environment through a number of strategies. It targets both indoor and outdoor air quality, several types of pollution, food security, environmental crime, citizen health, and the exploitation of natural resources - along with many other focus areas. The strategy specifically targets buildings by:

- Requiring automatic temperature regulation and control devices be installed in all public buildings
- Implementing an incentive scheme for older buildings within seismic hazardous areas to improve their resiliency
- Creating charging networks for electric vehicles
- Promoting sustainable construction techniques that result in energy and material savings, appropriate sanitary conditions, and a qualitative improvement of buildings
- Constructing water plazas
- Initiating the monitoring of building efficiency
- Providing fiscal measures for the upgrading of facilities¹

GREEN RESIDENTIAL HOUSING

The Venice Municipal Energy Plan requires the implementation of energy efficiency criteria in public buildings. The energy consumed by public buildings across the city is constantly monitored to determine what buildings need efficiency upgrades. Upgrades to the municipal building stock include enhanced thermal insulation measures, the replacement of inefficient technologies with newer more modern options, and the installation of photovoltaic panels.

PRIVATE SECTOR INCENTIVES

Italy offers tax incentives for energy efficiency improvements to residential and commercial existing properties for retrofit measures. These retrofits include thermal insulation, installation of solar panels, the replacement of heating and air-conditioning systems, and other energy conservation strategies. Tax credits can cover up to 55% of the related costs, not to exceed a maximum value that is determined by type of measure taken. For instance, the maximum incentive for thermal insulation is capped at USD\$83,658.²

CITY EMISSIONS TARGET:

Venice hopes to achieve a 22% reduction by 2020, compared with 2005 emissions levels.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✗

CITY DETAILS

Population	270,000
Land Area (km ²)	414
Gross Domestic Product (in USD billions)	--
Average Walk Score ³	69/100
Annual Rainfall (mm/year)	748.4
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁴	1,400,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Italy) ⁵	263
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PROJECT BREAKDOWN

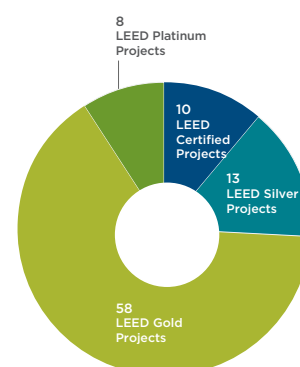


0
LEED Certified
Projects (Venice)

1
LEED Registered
Projects (Venice)

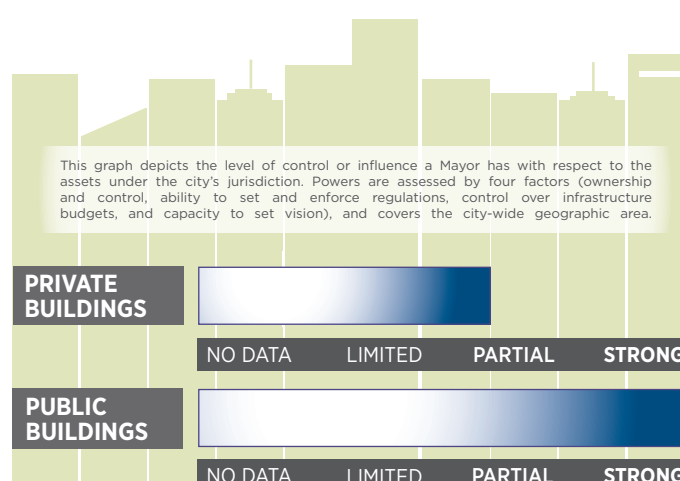
89
LEED Certified
Projects (Italy)

169
LEED Registered
Projects (Italy)



Graph depicts the distribution of LEED certified projects in Italy

MAYORAL POWERS



POLICY SPOTLIGHT:

Instituted in 2008, Venice's Urban Mobility Plan aims to increase cycling and the use of public transportation within the city. Through the project, two electric tram lines have been installed and over 100 km of bike lanes have been constructed: both bicycle and car sharing schemes will be introduced under the plan as well. Implementation of the plan has led to an estimated annual reduction of 148,829 metric tons CO₂ equivalent.⁶

SUSTAINABLE COMMUNITIES

The city has implemented the Mose System in an effort to alleviate the effects of rising tides. It consists of mobile barriers able to temporarily separate the lagoon from the sea in order to protect the city from destructive weather events and more frequent tidal surges. The cost of the system is approximately €5,493,000,000, all of which was financed by the Italian State. The main objectives of the system are:

- Stop the water in case of exceptional high tide
- Let water circulate freely in normal tides
- Maintain the operability of the port
- Disappear when not in use⁷

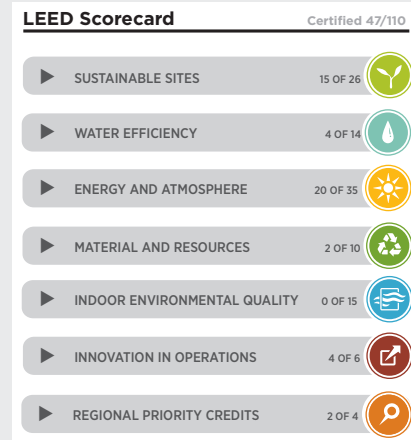
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4. C40 Cities Climate Leadership Group and the Carbon Disclosure Project. (2013) City Data Inventory.
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8. USGBC: Directory: Projects: Sede Centrale Ca Foscari: <http://www.usgbc.org/projects/sede-centrale-ca-foscari>.
9. Green Building Information Gateway: Bottega Veneta Atelier: <http://www.gbgi.org/activities/leed-1000016088>.

PROJECT SPOTLIGHT:

Sede Centrale Ca Foscari

Venice's Sede Centrale Ca Foscari achieved a Certified rating under the LEED for Existing Buildings rating system in June 2013. The building's design resulted in a 30% reduction in indoor potable water use, against a modeled baseline. Occupants experienced a 75% reduction in conventional commuting trips. The structure also achieved a 95 ENERGY STAR® Performance Rating.⁸



PROJECT SPOTLIGHT:

Bottega Veneta Atelier

Bottega Veneta's Venice manufacturing space achieved Platinum certification under the LEED for New Construction rating system in March 2014. The building's design resulted in a 50% reduction in potable landscape water use, a 40% reduction in indoor water use, and a 50% reduction in wastewater generation, all against a modeled baseline. The project generates 7% of its power needs through on-site renewable energy resources. 20% of the materials used in construction were extracted, harvested, recovered, or manufactured within a 500 mile radius of the project site.⁹

GREEN BUILDING CITY MARKET BRIEF

WARSAW

POLAND



LEADING BY EXAMPLE

To meet its greenhouse gas emissions reductions goal, the city of Warsaw will spend €230 million retrofitting public buildings. The plan includes updating outdoor lighting systems throughout the city to newer more energy-efficient systems, as well as modernizing the mass transit system with energy-efficient metro trains, modern buses (including hybrids), new rapid-city trains, and new trams capable of recovering brake energy.¹

GREEN CODES

Under new EU requirements, all public buildings in Poland will be required to be near-passive or highly energy efficient by 2018. By 2020, all newly constructed buildings in Poland must be near-passive or highly energy-efficient.²

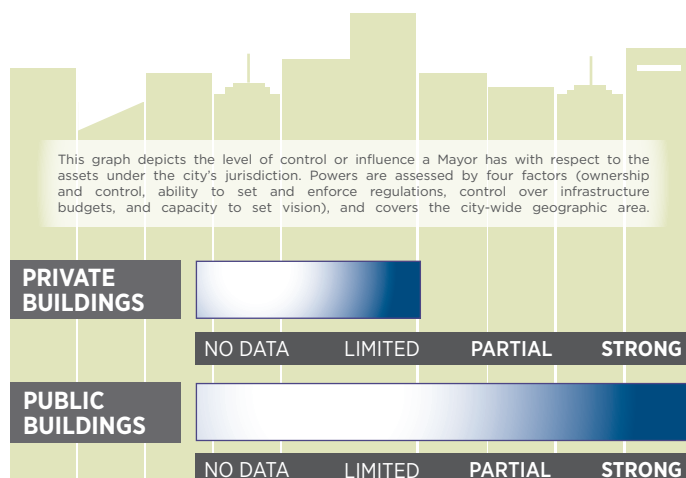
GREEN RESIDENTIAL BUILDINGS

The city of Warsaw has ambitious plans for the mass weatherization retrofitting of the city's residential building stock. The proposed actions will cut Warsaw's heating energy consumption by two terawatt hours (TWh). To fund this endeavor, the city will rely on future savings in an energy performance contracting formula, as well as funds available in the next European Union financial perspective (2014-2020). Warsaw also participates in two European Union sponsored programs, E3SoHo and Ice-Wish, which both target energy efficiency in public housing.³

CITY EMISSIONS TARGET:

Poland aims to reduce its emissions by 20% by 2020, compared with 2007 emissions levels.

MAYORAL POWERS



CITY DETAILS

Population	1.72 million
Land Area (km ²)	517
Gross Domestic Product (in USD billions)	74.3
Average Walk Score ⁴	100/100
Annual Rainfall (mm/year)	719
Climate Action Plan	No

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁵	13,300,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Poland) ⁶	102
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PROJECT BREAKDOWN

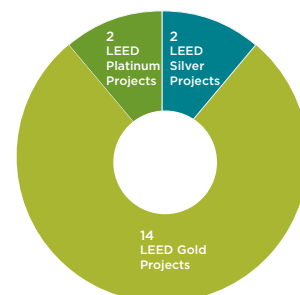


18
LEED Certified
Projects (Warsaw)

37
LEED Registered
Projects (Warsaw)

38
LEED Certified
Projects (Poland)

103
LEED Registered
Projects (Poland)



Graph depicts the distribution of LEED certified projects in Warsaw

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✗
New/Existing Commercial Building Incentives	✗
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

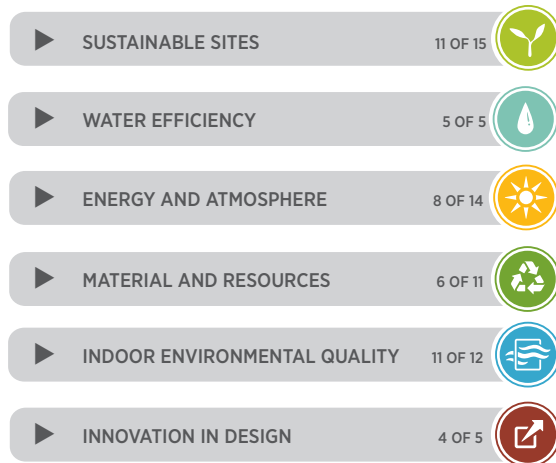
PROJECT SPOTLIGHT:

The Green Corner

Warsaw's Green Corner achieved Platinum certification under the LEED for Core and Shell 2.0 rating system in February 2013. The design resulted in a 21% improvement on baseline building performance rating and reduced wastewater generation by 50%.⁷

LEED Scorecard

Platinum 45/62



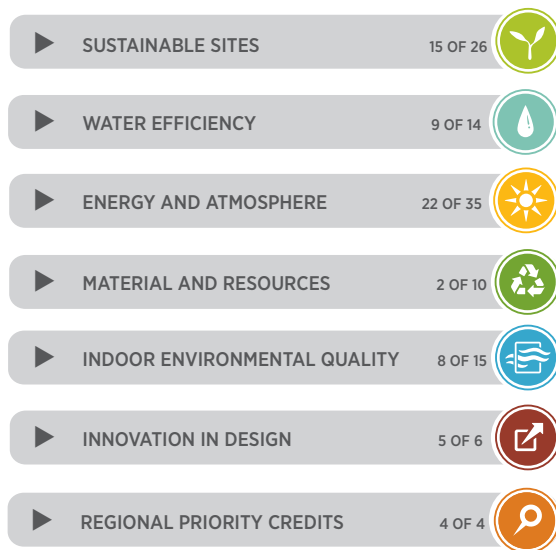
PROJECT SPOTLIGHT:

The Victoria Building

The Victoria Building earned Gold certification under the LEED for Existing Buildings 2009 rating system in May, 2014. The project achieved a 30% reduction in indoor potable water use and a 75% reduction in potable landscape water use, both against a modeled baseline. Occupants experienced a 56% reduction in conventional commuting trips. The project also received an 83 ENERGY STAR® Performance Rating.⁸

LEED Scorecard

Gold 65/110



PROJECT SPOTLIGHT:



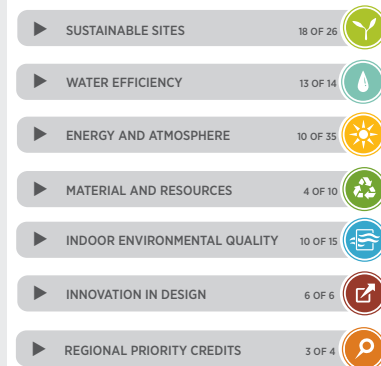
Photo courtesy of Flickr Creative Commons user Maciej Janiec

Warsaw Financial Center

Warsaw's Financial Center achieved Gold certification under the LEED for Existing Buildings rating system in October 2014. The building's design resulted in a 30% reduction in indoor potable water use and a 100% reduction in potable water use, both against a modeled baseline. Durable goods in the building are reused or recycled at a rate of 75%. Occupants experienced a 69% reduction in conventional commuting trips. The building also achieved a 73 ENERGY STAR® Performance Rating.⁹

LEED Scorecard

Gold 64/110



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AFRICA

- ▶ ADDIS ABABA
- ▶ CAPE TOWN
- ▶ DAR ES SALAAM
- ▶ JO'BURG
- ▶ LAGOS
- ▶ NAIROBI

- ▶ **NORTH AMERICA**
- ▶ **CENTRAL & SOUTH AMERICA**
- ▶ **EUROPE**
- ▶ **AFRICA**
- ▶ **SOUTH & WEST ASIA**
- ▶ **EAST ASIA**
- ▶ **SOUTHEAST ASIA & OCEANIA**

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GREEN BUILDING CITY MARKET BRIEF

ADDIS ABABA

ETHIOPIA



NATIONAL MOVEMENT

Ethiopia's Green Economy Strategy aims to protect the country from the adverse effects of climate change and to build a green economy that will help the nation realize its ambition of reaching middle-income status before 2025. The strategy, introduced in 2011, has identified and prioritized more than 60 initiatives that will help Ethiopia reach its development goals while maintaining a low-carbon society. The Green Economy Strategy is based on four pillars: improving crop and livestock production practices for higher food security and farmer income while reducing emissions, protecting and re-establishing forests for their economic and ecosystem services including carbon sinks, expanding electricity generation from renewable sources of energy for domestic and regional markets, and leap-frogging to modern and energy-efficient technologies in the transportation, industrial, and building sectors.¹

PROJECT SPOTLIGHT

The United States New Embassy Compound in Addis Ababa achieved LEED Certification under the LEED for New Construction rating system in July 2012. The building's design resulted in a 20% reduction in indoor water use and a 14% improvement on building performance rating, both against a modeled baseline.²

CITY-LEVEL POLICIES PRESENT

Green Building Codes	X
Energy Benchmarking and Data Transparency	X
Green Municipal Buildings	X
New/Existing Commercial Building Incentives	X
New/Existing Residential Building Incentives	X
Green Schools	X
Neighborhood-Scale Sustainability	X

CITY EMISSIONS TARGET:

The city of Addis Ababa has pledged to reduce its greenhouse gas emissions by 75% by 2020 compared to 2010 levels.

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5. LEED Professionals and Project Figures were retrieved on 6 January 2015.

CITY DETAILS

Population	2.9 million
Land Area (km ²)	540
Gross Domestic Product (in USD billions)	12
Average Walk Score ³	53/100
Annual Rainfall (mm/year)	1,026
Climate Action Plan	No

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁴	300,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

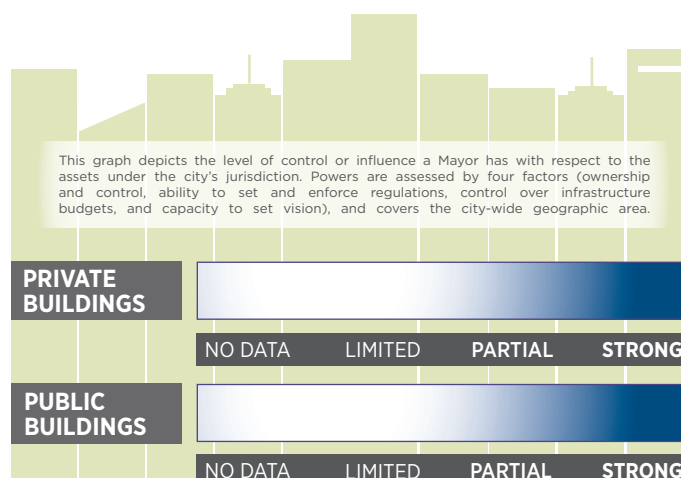
LEED Credentialed Professionals (Ethiopia) ⁵	0
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PROJECT BREAKDOWN



- 1 LEED Certified Projects (Addis Ababa)
- 3 LEED Registered Projects (Addis Ababa)
- 1 LEED Certified Projects (Ethiopia)
- 3 LEED Registered Projects (Ethiopia)

MAYORAL POWERS



GREEN BUILDING CITY MARKET BRIEF

CAPE TOWN

SOUTH AFRICA



A CITY-WIDE MOVEMENT

The city of Cape Town encourages residents to participate in climate change mitigation with the production of the Smart Living Handbook, last updated in May 2011. The handbook contains four sections focusing on waste, energy, water, and biodiversity. Each section includes tips and informative steps that can be taken to reduce an individual's environmental impact. Included with the handbook is a sustainability quiz that enables residents to gauge their level of knowledge.¹

LEADING BY EXAMPLE

Cape Town participates in the National Department of Energy's Municipal Energy Efficiency Demand Side Management program. The program consists of a grant fund that is disbursed to municipalities for the purposes of implementing energy efficient retrofits within the existing municipal infrastructure. Cape Town uses its allocation of grant funds to update the city's street lighting to more efficient LED systems, renovate building lighting, increase water pump efficiency, and build workforce capacity.²

GREEN SCHOOLS

The Youth Environmental School (YES) is a year-round program run by the city that seeks to provide the city's youth with access to environmental education opportunities. Through the program, students observe energy efficiency in school buildings and complete energy audits, as well as participate in campaigns focusing on energy efficiency, smart living, and biodiversity. Educational programming is featured at most nature reserves in Cape Town. Additionally, YES EduNet is a free online tool for educators with resources and information on environmental issues, outings and workshops.³

PRIVATE SECTOR INCENTIVES

The New South Wales Environmental Upgrade Agreement program provides funds to property owners seeking to improve property sustainability. The government recoups the money advanced to property owners by instituting a quarterly charge on their land. Eligible upgrade measures include:

- Increasing energy and/or water efficiency
- Preventing or reducing pollution and waste
- Reducing material consumption
- Reducing use of private motor vehicles
- Reducing greenhouse gas emissions⁸

SUSTAINABLE COMMUNITIES

The city of Sydney manages the Green Villages program, which is designed to help local residents lead more sustainable lifestyles. The program features green workshops, grants funding (including matching volunteer time with cash for materials or equipment), and the development of community gardens and the first city farm.

CITY DETAILS

Population	3.74 million
Land Area (km ²)	2,445
Gross Domestic Product (in USD billions)	56.8
Average Walk Score ⁴	93/100
Annual Rainfall (mm/year)	515
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e)	--
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

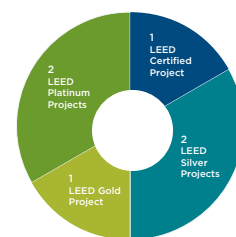
MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (South Africa) ⁵	12
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PROJECT BREAKDOWN



- 1 LEED Certified Projects (Cape Town)
- 2 LEED Registered Project (Cape Town)
- 6 LEED Certified Projects (South Africa)
- 13 LEED Registered Projects (South Africa)
- 62 Green Star Certified Projects (South Africa)
- 88 Green Star Registered Projects (South Africa)



Graph depicts the distribution of LEED certified projects in South Africa

CITY-LEVEL POLICIES PRESENT

Green Building Codes	X
Energy Benchmarking and Data Transparency	X
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	X
New/Existing Residential Building Incentives	X
Green Schools	✓
Neighborhood-Scale Sustainability	X

POLICY SPOTLIGHT:

In May 2010, the Cape Town City Council approved the Energy and Climate Action Plan with the overarching goal of achieving energy security. The plan consists of two levels of criteria and eleven separate objectives, some examples of the objectives include adapting and building resilience to climate change, enabling local economic development in the energy sector, raising awareness and promoting behavior changes through communication and education, and a goal of generating 10% renewable and clean energy supply 2020.⁶

PROJECT SPOTLIGHT:

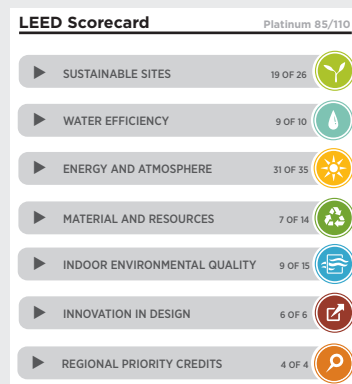
No. 1 Silo - W&A Waterfront

Cape Town's No. 1 Silo - V & A Waterfront building achieved a 6 Star rating under the Green Star Office v1 rating system in February 2010. The structure consists of 18,600 square meters of gross leasable office space and another 500 square meters of retail space, with a two level parking structure. The building features an innovative sea water cooling system. Additional sustainability features include a high-performance façade that controls thermal performance and comfort, a green roof that contributes to insulation and stormwater retention, and an information and communication technology system that monitors energy and water use.⁷

PROJECT SPOTLIGHT:

Hotel Verde

Cape Town's Hotel Verde achieved Platinum certification under the LEED for New Construction rating system in May 2014. The hotel's design resulted in a 100% reduction in potable landscape water use, a 50% reduction in wastewater generation, and a 40% reduction in indoor water use; each against a modeled baseline. Nice percent of the building's energy load is generated renewably on-site, and the hotel has entered into a green power purchase agreement. Additionally, the hotel offers guest incentives, in the form of "Verdinos" that reward guests for sustainable behavior such as recycling, reusing towels and bedding, not using an air conditioner, and using the power-generating gym equipment. "Verdinos" can be collected at the reception desk and redeemed at the hotel's 24-hour deli or at its bar.⁸



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GREEN BUILDING CITY MARKET BRIEF

DAR ES SALAAM

TANZANIA



NATIONAL MOVEMENT

Tanzania's National Strategy for Growth and Reduction of Poverty, paired with the National Environmental Management Act, has established land degradation, environmental pollution, lacking access to good environmental health, and loss of biodiversity as major issues that the country plans to address.¹

LEADING BY EXAMPLE

In 1992, Dar es Salaam became a member of the Global Sustainable Cities Program (SCP) and prioritized the environmental issues facing the metropolitan area. The city adopted an environmental planning and management approach to promote bottom-up planning and partnerships in development activities so that efficient and equitable development can occur. The adoption of these strategies has helped to make Dar es Salaam a cleaner, more prosperous city.²

SUSTAINABLE COMMUNITIES

With investment from the World Bank, Dar es Salaam has been able to establish a rapid transit system called "DART," or Dar Rapid Transit Agency. The system is scheduled to open in 2015, and is projected to have a daily ridership of 300,000 passengers. A comprehensive public transportation system will be integral to reducing emissions in the city.³

CITY EMISSIONS TARGET:

No emissions target is currently available at the city or national level.

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4. Walk Score measures the walkability of a city by measuring community connectivity and pedestrian friendliness. Walk Score's methodology is available at <http://walkscore.com/methodology.shtml>.
5. LEED Professionals and Project Figures were retrieved on 9 January 2015.

CITY DETAILS

Population	4.4 million
Land Area (km ²)	1,590
Gross Domestic Product (in USD billions)	--
Average Walk Score ⁴	63/100
Annual Rainfall (mm/year)	1,066
Climate Action Plan	No

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e)	--
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Tanzania) ⁵	0
---	---

PROJECT BREAKDOWN

	0 LEED Certified Projects (Dar Es Salaam)
	0 LEED Registered Projects (Dar Es Salaam)
	0 LEED Certified Projects (Tanzania)
	3 LEED Registered Projects (Tanzania)

CITY-LEVEL POLICIES PRESENT

Green Building Codes	X
Energy Benchmarking and Data Transparency	X
Green Municipal Buildings	X
New/Existing Commercial Building Incentives	X
New/Existing Residential Building Incentives	X
Green Schools	X
Neighborhood-Scale Sustainability	X

GREEN BUILDING CITY MARKET BRIEF

JOHANNESBURG

SOUTH AFRICA



CITY-WIDE MOVEMENT

The city of Johannesburg recently issued a green city bond with the goal of developing capital for green initiatives to reduce the city's greenhouse gas emissions. The innovative financing mechanism raises funds from investors to support projects intended to mitigate climate change. The bond issuance was a major success at 150% oversubscription, demonstrating city and investor commitment to a sustainable Johannesburg moving forward.¹

GREEN CODES

Beginning in February 2014, building plans being considered for approval by the Department of Planning and Urban Management are to be evaluated for their energy efficiency. Natural heating provided in winter by proper building fenestration and eave overhangs of at least 700mm to facilitate summer shading and winter daylighting are some of the measures being assessed. Additional consideration will be given to a proposed project's inclusion of renewable energy, advanced insulation measures, and efficient lighting fixtures and appliances.²

GREEN AFFORDABLE HOUSING

In June 2010, the city of Johannesburg began implementing a Climate Proofing of Urban Communities Project in 700 low-income households. The project, funded by the Danish International Development Agency, involves the installation of low-pressure solar water heating units and isolated isoboard ceilings, as well as the distribution of compact fluorescent lamps.³

ENVIRONMENTAL EDUCATION

Johannesburg City Parks Department established an environmental education unit in 2002 to engage with young learners across the city and to teach them the importance of maintaining a safe and healthy environment. The unit hosts educational awareness programs for school groups at one of three environmental education centers in the city.⁴

CITY EMISSIONS TARGET:

The city of Johannesburg aims to achieve a 30% reduction in Co2 emissions by 2025 compared to 2005 levels.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	X
Energy Benchmarking and Data Transparency	X
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	X
New/Existing Residential Building Incentives	X
Green Schools	✓
Neighborhood-Scale Sustainability	X

CITY DETAILS

Population	4.4 million
Land Area (km ²)	1,645
Gross Domestic Product (in USD billions)	76
Average Walk Score ⁵	77/100
Annual Rainfall (mm/year)	726
Climate Action Plan	No

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁶	19,540,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (South Africa) ⁷	12
---	----

PROJECT BREAKDOWN



1
LEED Certified Project
(Johannesburg)

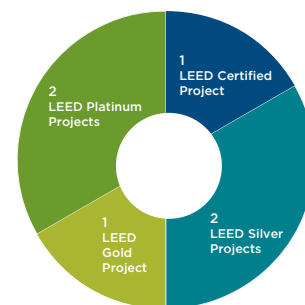
2
LEED Registered
Projects (Johannesburg)

6
LEED Certified
Projects (South Africa)

13
LEED Registered
Projects (South Africa)

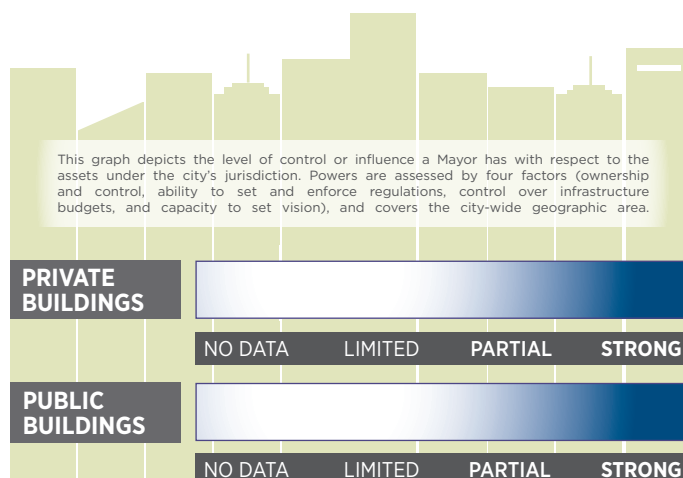
62
Green Star Certified
Projects (South Africa)

88
Green Star Registered
Projects (South Africa)



Graph depicts the distribution of LEED certified projects in South Africa

MAYORAL POWERS



SUSTAINABLE COMMUNITIES

Johannesburg is currently implementing the first Bus Rapid Transit (BRT) system on the African continent. The system, Rea Vaya is intended to reach 80% of city residents and has the potential to reduce Co2 emissions by 1.6 million tons by 2020, the time of project's estimated completion. The BRT, upon completion, is expected to span 330 kilometers, connecting the city center to low-income populations.⁸

PROJECT SPOTLIGHT:

New Consulate Compound Johannesburg

The New Consulate Compound in Johannesburg achieved LEED certification at the Certified level under the LEED for New Construction 2.2 rating system in May 2010. The building's design resulted in a 17.5% building performance rating improvement and a 20% reduction in indoor potable water usage, each against a modeled baseline.⁹

LEED Scorecard

Certified 30/69



PROJECT SPOTLIGHT:

Alexander Forbes

Johannesburg's Alexander Forbes building achieved a 4 Star rating under the Green Star South Africa Office v1 rating system in August 2012. The building is located across from a major transit station, providing occupants with the option to use train, light rail, or bus as an alternative to private cars. 58% of the office area has daylighting sufficient to allow the lights to be turned off during the day. Motion occupancy sensors detect unoccupied spaces and switch off systems accordingly.¹⁰



Photo courtesy of Flickr Creative Commons user Dwayne Kloppers

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GREEN BUILDING CITY MARKET BRIEF

LAGOS

NIGERIA



A CITY-WIDE MOVEMENT

Conserve Energy, Save Money is a program instituted by the Lagos State Government's Ministry of Energy and Mineral Resources, in cooperation with the Lagos State Electricity Board, providing city residents with step-by-step, do-it-yourself instructions for energy efficiency and conservation improvements. The goal of the program is to help save citizens money while creating a more energy efficient city.¹

GREEN SCHOOLS

Lagos' Power Kids Program is an interactive, extra-curricular activity that teaches children about electricity and alternative forms of energy. The program consists of a ten-week training course for students from 30 of the city's public schools.²

SUSTAINABLE COMMUNITIES

Lagos' Bus Rapid Transit (BRT) system provides high performance transportation in the city center. Its implementation has directly created employment for over 1,000 people. The system averages 180,000 riders a day, a number that exceeded planned estimates by 200%. Work is ongoing to expand the current 22 km BRT scheme.³

CITY EMISSIONS TARGET:

No emissions target is currently available at the city or national level.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	X
Energy Benchmarking and Data Transparency	X
Green Municipal Buildings	X
New/Existing Commercial Building Incentives	X
New/Existing Residential Building Incentives	X
Green Schools	✓
Neighborhood-Scale Sustainability	X

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2. Lagos State Government: Lagos Power Kids Program: <http://www.lseb.gov.ng/content/lagos-power-kids-program>.
3. Lagos Metropolitan Area Transport Authority: BRT/BFS: <http://www.lamata-ng.com/brt.php>.
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CITY DETAILS

Population	13.4 million
Land Area (km ²)	999.6
Gross Domestic Product (in USD billions)	43
Average Walk Score ⁴	75/100
Annual Rainfall (mm/year)	1,066
Climate Action Plan	No

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁴	17,200,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Nigeria) ⁵	9
--	---

PROJECT BREAKDOWN



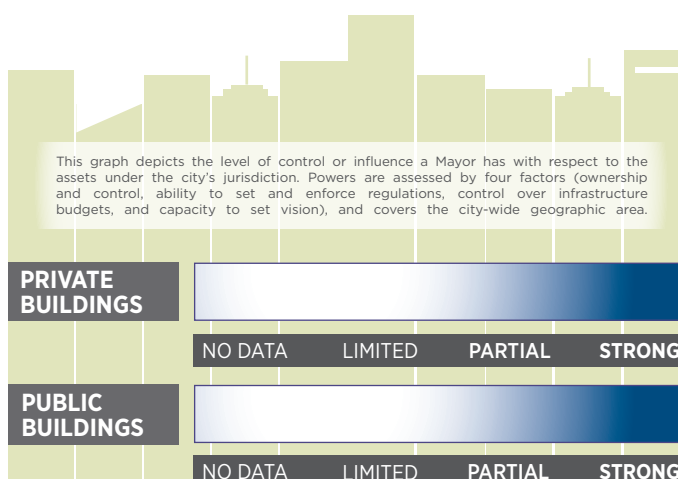
0
LEED Certified
Projects (Lagos)

4
LEED Registered
Projects (Lagos)

0
LEED Certified
Projects (Nigeria)

12
LEED Registered
Projects (Nigeria)

MAYORAL POWERS



GREEN BUILDING CITY MARKET BRIEF

NAIROBI

KENYA



A CITY-WIDE MOVEMENT

The Nairobi Metro 2030 Strategy is a plan developed in 2008 to make the city more competitive on a global scale while also improving quality of life for city residents. The overarching goal of the plan is to make Nairobi a competitive world-class city, as well as to address issues like urban sprawl and ecological resilience. For example, the plan proposes urban growth boundaries be mandated to prevent sprawl and envisions public-private partnerships as a way to improve water and sanitation systems.¹

PRIVATE SECTOR INCENTIVES

Kenya's Community Education and Empowerment Center (CEEC) offers subsidized energy auditing services with the support of the nation's Ministry of Energy and the Danish International Development Agency. The program is open to all companies doing business in Kenya that are interested in reducing their energy consumption. CEEC also offers energy management training sessions that provide participants with practical strategies for energy management.²

SUSTAINABLE COMMUNITIES

Once a month the Nairobi Metropolitan Development Ministry hosts a clean-up day to improve and protect environmental quality in the city. The public is welcomed to participate. The goal of the event is to increase public environmental awareness.

Kenya Slum Upgrading Program (KENSUP) is a partnership with UN-HABITAT to transform slums in Kenya's major metropolitan areas into safe, productive, and sustainable neighborhoods. The program's key goals include implementing better solid waste and environmental management. A special fund has been dedicated to improving slums in Nairobi.³

CITY-LEVEL POLICIES PRESENT

Green Building Codes	X
Energy Benchmarking and Data Transparency	X
Green Municipal Buildings	X
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	X
Neighborhood-Scale Sustainability	X

CITY DETAILS

Population	3.38 Million
Land Area (km ²) ⁴	684
Gross Domestic Product (in USD billions)	12
Average Walk Score ⁵	95/100
Annual Rainfall (mm/year)	1,061.5
Climate Action Plan	Yes (National)

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e)	--
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Kenya) ⁵	13
--	----

PROJECT BREAKDOWN



0
LEED Certified
Projects (Nairobi)

14
LEED Registered
Projects (Nairobi)

0
LEED Certified
Projects (Kenya)

15
LEED Registered
Projects (Kenya)

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5. Walk Score measures the walkability of a city by measuring community connectivity and pedestrian friendliness. Walk Score's methodology is available at <http://walkscore.com/methodology.shtml>.
6. LEED Professionals and Project Figures were retrieved on 6 January 2015.

SOUTH AND WEST ASIA

- ▶ DELHI
- ▶ DHAKA NORTH
- ▶ DHAKA SOUTH
- ▶ KARACHI
- ▶ MUMBAI

- ▶ NORTH AMERICA
- ▶ CENTRAL & SOUTH AMERICA
- ▶ EUROPE
- ▶ AFRICA
- ▶ SOUTH & WEST ASIA
- ▶ EAST ASIA
- ▶ SOUTHEAST ASIA & OCEANIA

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GREEN BUILDING CITY MARKET BRIEF

DELHI NCT **INDIA**

STATE AND NATIONAL ENCOURAGEMENT OF GREEN BUILDING

Buildings seeking to receive environmental clearance from the Expert Appraisal Committee, state or national, will receive priority if they have obtained a green building rating label certification with a reputable standard; including pre-certified and provisionally certified structures. The National Action Plan on Climate Change was released in June of 2008, through the Prime Minister's Council on Climate Change. The plan includes eight missions spanning through 2017 that will help decrease the nation's greenhouse gas emissions. They include: a solar mission, a mission to enhance energy efficiency, a mission on sustainable habitats, water mission, a mission for sustaining the Himalayan ecosystem, a mission for a green India, a mission for sustainable agriculture, and a mission on strategic knowledge on climate change.

GRIHA has been adopted as the national rating system for green buildings by the Ministry of New and Renewable Energy (MNRE). It is mandatory for all new public sector projects to achieve at minimum a 3 Star GRIHA rating.

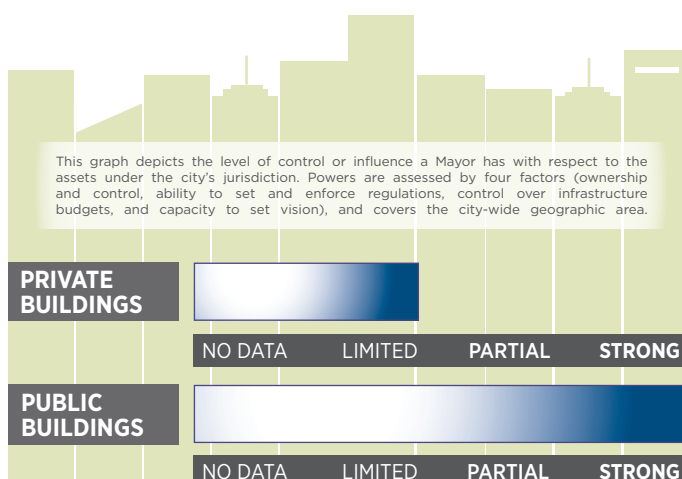
LEADING BY EXAMPLE

India's Perform, Achieve, and Trade (PAT) Scheme is the second cap-and-trade initiative in Asia to test the market. The plan is slated to reduce 26 million tons of CO₂ by 2015 and contribute to national target reductions of 20-25% in carbon intensity levels from 2005 by 2020. The PAT Scheme sets plant specific targets instead of sector targets, providing each building owner with a baseline CO₂ emissions figure and the reductions being made from the baseline.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✗
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✗

MAYORAL POWERS



CITY DETAILS

Population	11 million
Land Area (km ²)	1,484
Gross Domestic Product (in USD billions)	58
Average Walk Score ¹	100/100
Annual Rainfall (mm/year)	797.3
Climate Action Plan	No

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e)	--
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (India) ²	571
--	-----

PROJECT BREAKDOWN



15
LEED Certified
Projects (Delhi NCT)

20
LEED Registered
Projects (Delhi NCT)

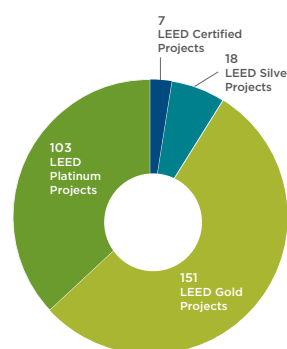
279
LEED Certified
Projects (India)

384
LEED Registered
Projects (India)

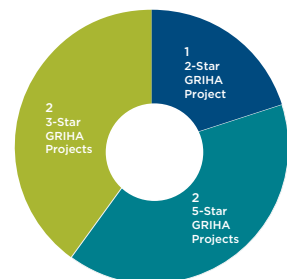
5
GRIHA Certified
Projects (Delhi NCT)

45
GRIHA Registered
Projects (Delhi NCT)

64
GRIHA Certified
Projects (India)



Graph depicts the distribution of LEED certified projects in India



Graph depicts the distribution of GRIHA projects in Delhi NCT

CITY EMISSIONS TARGET:

India has pledged to reduce its carbon intensity by 20-25% by 2020, compared to 2005 numbers.

PRIVATE SECTOR INCENTIVES

Sustainability measures should be included in layout plans of plots 3,000 square meters and above. Encouraged features are to include, but are not limited to: rainwater storage tanks, ground water recharge measures, treatment of wastewater, sewage treatment, solar heating systems will be provided for buildings with a roof area larger than 300 square meters. To promote the aforementioned green building features, density bonus incentives of 1% to 4% extra ground coverage and FAR (floor area ratio) will be awarded by local bodies to developers. Incentive amounts are based on the buildings performance with regards to the Green Rating for Integrated Habitat Assessment (GRIHA).

Property owners in Delhi electing to install rooftop solar energy systems are eligible to receive financial incentives from the central government. Incentive levels range from 2,400 Indian Rupees for solar lanterns, to 270,000 Indian Rupees for stand-alone power plants capable of producing more than 10kWp.³

GREEN CODES

India's Bureau of Energy Efficiency released the Energy Conservation Building Code (ECBC) in 2007; the code sets performance standards for commercial buildings that have a connected load of 100kW or greater, and outlines best strategies for energy-efficient design and construction. The Government of Delhi has mandated that all government-related buildings implement the Energy Conservation Building Code. To establish a baseline for new building construction, Delhi has adopted GRIHA (Green Rating for Integrated Habitat Assessment) ratings in conjunction with the ECBC, and National Building Code to develop 3 Star (GRIHA) government buildings.⁴

SUSTAINABLE DEVELOPMENT

Delhi's 12th Five Year Plan calls on the construction industry to work with the Bureau of Energy Efficiency to establish green building guidelines based on a number of factors including: environmental impact, indoor environmental quality, community issues, sustainable building sites, and energy efficiency. The Government of the National Capital Territory of Delhi has promised that during the period of the 12th Five Year plan, concrete steps will be taken to support green building.

Delhi's Construction Industry Development Council (CIDC) is taking the lead in establishing guidelines promoting green construction practices. CIDC is working with the Building Construction Authority of Singapore to implement a Green Mark for Buildings rating system based on India's climate and environment.⁵

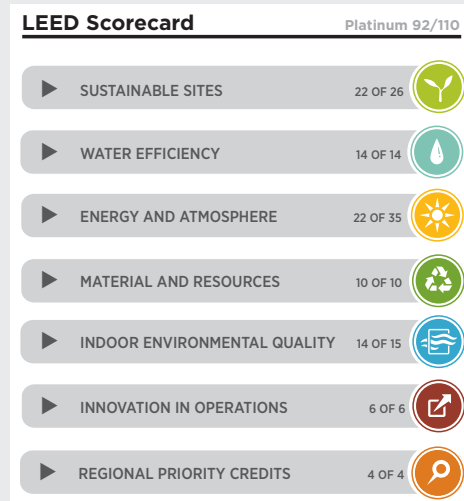
GREEN SCHOOLS

India's Centre for Science and Environment manages the Green Schools Program in which, students evaluate their school's environmental practices. Students are educated on sustainable and environmentally friendly practices through the Green Schools Program Manual; they then use this knowledge to fill out a report card for their school.

PROJECT SPOTLIGHT:

ITC Maurya Hotel

The ITC Maurya Hotel became Platinum Certified under LEED for Existing Buildings 2009 in December 2010. It is the first hotel in the world to achieve a Platinum rating under the Existing Buildings rating system. Features that helped the hotel achieve this rating include: a green roof, native vegetation, no potable water used for irrigation, reduced peak period vehicle trips, green seal certified cleaning products, as well as the usage of a solar thermal system for hot water.⁶



REFERENCES

1. Walk Score measures the walkability of a city by measuring community connectivity and pedestrian friendliness. Walk Score's methodology is available at <http://walkscore.com/methodology.shtml>.
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GREEN BUILDING CITY MARKET BRIEF

DHAKA NORTH

BANGLADESH



As of 2011 Dhaka North and Dhaka South have been self-governing entities with two administrations.

A CITY-WIDE MOVEMENT

Dhaka is experiencing a large surge in green building. In recent years, Bangladesh has achieved high economic growth accompanied by rapid urbanization. As the ninth most populous and twelfth most densely populated country in the world, Bangladesh's rising population and limited land space have placed unique challenges on its capital, Dhaka. To meet the combined challenges of climate change and rapid growth, Dhaka is now experiencing a movement towards green building, increasing the density and efficiency of existing housing stock. The first green building in Bangladesh was built in May 2011 and since then a total of 11 LEED buildings have been constructed.

LEADING BY EXAMPLE

Dhaka is investing in green factories. Recently two eco-factories for textiles began construction, and several more are in initial planning stages. Bangladesh Green Building Council (BGBC) was founded in 2011, and is the national representative for Bangladesh on the World Green Building Council. Supported by United Nations Framework Convention on Climate Change (UNFCCC) and Intergovernmental Panel on Climate Change (IPCC) fellows, the council provides a centralized national board for green building certifications, courses and outreach, consultancy services to private construction firms, and government initiatives within Bangladesh. The nation now has over 19,000 square meters of LEED certified space, all built since the founding of BGBC in 2011.¹

AFFORDABLE HOUSING

Dhaka's affordable housing system provides housing to government workers in the form of readymade apartments, independent houses, or duplex housing units, which are allocated based on income level. Demand continues to out pace supply for green buildings in Dhaka. The public housing system also supplies housing targeted to low-income and middle-income groups.

CITY EMISSIONS TARGET:

No emissions target is currently available for Dhaka.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✗
New/Existing Commercial Building Incentives	✗
New/Existing Residential Building Incentives	✗
Green Schools	✓
Neighborhood-Scale Sustainability	✗

CITY DETAILS

Population	3,773,004
Land Area (km ²)	62.6
Gross Domestic Product (in USD billions)	--
Average Walk Score ²	80/100 (entirety of Dhaka)
Annual Rainfall (mm/year)	1,854 (entirety of Dhaka)
Climate Action Plan	Yes (National)

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e)	--
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Bangladesh) ³	5
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PROJECT BREAKDOWN

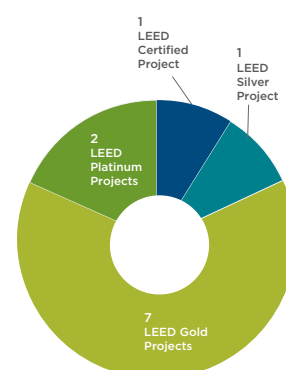


3
LEED Certified
Projects (Dhaka)

37
LEED Registered
Projects (Dhaka)

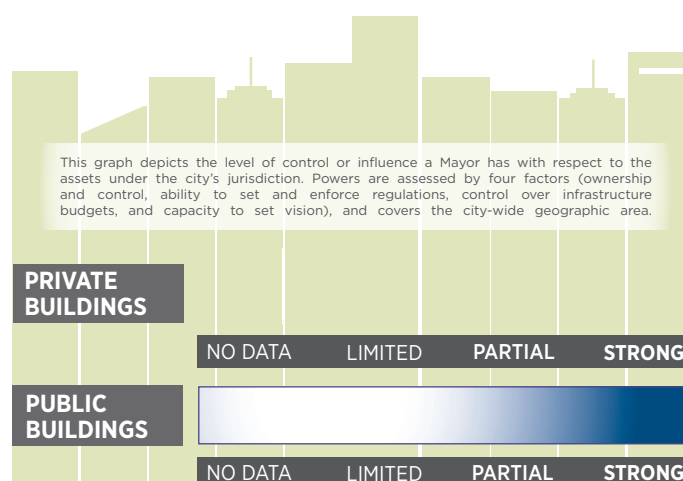
11
LEED Certified
Projects (Bangladesh)

62
LEED Registered
Projects (Bangladesh)



Graph depicts the distribution of LEED certified projects in Bangladesh

MAYORAL POWERS



GREEN CODES

The Bangladesh National Building Code (BNBC) is currently being upgraded by the Bangladesh University of Engineering & Technology (BUET) and is in its final stage of review. The latest version of the building code will include sections on sustainability and green design. Current building codes state that:

- New construction projects on land over 300 square meters are to have facilities for conserving and harvesting rainwater
- Clause 1.17.1 of the General Building Guidelines require that all rooms and interior spaces designated for human occupancy are to have natural or artificial lighting and natural or mechanical ventilation

GREEN SCHOOLS

Dhaka has a strong record of sustainable school design. Schools in Bangladesh have adopted passive cooling and are mostly constructed with local materials, reducing the buildings' carbon footprint during construction.

GREEN ROOFS

The last few decades of urbanization and high population growth in Dhaka has caused a significant decline in agricultural lands, green spaces, and access to potable water due to the increasing density and growth of the city limits into surrounding agricultural land. The green roof revolution is just beginning in Dhaka – there are now green roofs on institutional, hospital, commercial, and residential developments. While the number is still small, the movement is gaining popularity as it solves several common challenges, including reducing the energy requirements of buildings by acting as a natural cooling system, and increasing local food security by supplying fresh fruit and vegetables. Rainwater harvesting is also growing in popularity, reducing the significant problem of stormwater runoff and increasing local water security.⁵

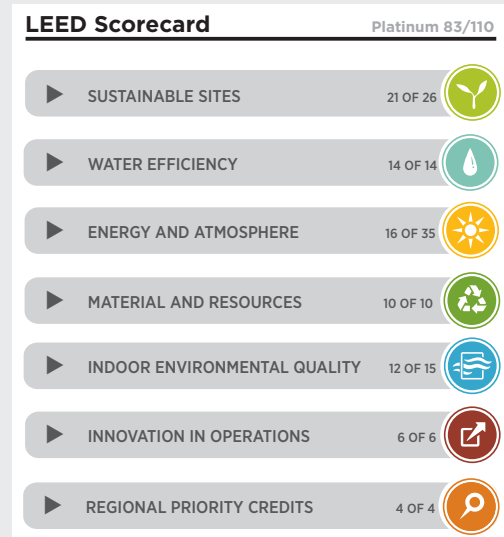
SUSTAINABLE COMMUNITIES

Dhaka's Integrated Solid Waste Management Master Plan is a comprehensive 10-year plan targeted at reducing waste generation and improving overall waste management in the capital city. The plan aims to manage municipal solid waste throughout its life-cycle, reduce greenhouse gas emissions, and encourage public and private sector participation. It is based on the improvement of three key operations items – Reduce, Reuse and Recycle – with a strong emphasis on raising public awareness, and a significant upgrade of the existing collection assets and sanitary landfills. Through the plan, Dhaka hopes to collect and treat at least 68% of the waste produced in the inner metropolitan area, which would mean an accumulated 180% increase in collection and final disposal efficiency in comparison to 2005's 44% collection rate.⁶

PROJECT SPOTLIGHT:

Genesis Washing Factory

The Genesis Washing factory achieved a Platinum rating under the LEED for Existing Buildings rating system in August 2013. The building's design resulted in a 30% reduction in indoor potable water use and a 100% reduction in potable water used for landscaping, both against a modeled baseline. Ongoing consumables associated with the facility are reused, recycled, or composted at a rate of 50%. The structure also achieved a 79 ENERGY STAR® Performance Rating.⁷



REFERENCES

1. Institute for Building Efficiency: Green Building Rating Systems: Bangladesh: <http://bit.ly/1xaXVEg>.
2. Walk Score measures the walkability of a city by measuring community connectivity and pedestrian friendliness. Walk Score's methodology is available at <http://walkscore.com/methodology.shtml>.
3. LEED Professionals and Project Figures were retrieved on 6 January 2015.
4. Bangladesh National Building Code: <http://buildingcode.gov.bd/>.
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6. City Climate Leadership Awards: Dhaka: Integrated Solid Waste Management Plan: <http://cityclimateleadershipawards.com/2014-project-dhaka-water/>.
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GREEN BUILDING CITY MARKET BRIEF

DHAKA SOUTH

BANGLADESH



As of 2011, Dhaka North and Dhaka South have been self-governing entities with two administrators.

A CITY-WIDE MOVEMENT

Dhaka is experiencing a large surge in green building. In recent years, Bangladesh has achieved high economic growth accompanied by rapid urbanization. As the ninth most populous and twelfth most densely populated country in the world, Bangladesh's rising population and limited land space have placed unique challenges on its capital, Dhaka. To meet the combined challenges of climate change and rapid growth, Dhaka is now experiencing a movement towards green building, increasing the density and efficiency of existing housing stock. The first green building in Bangladesh was built in May 2011 and since then a total of 11 LEED buildings have been constructed.

LEADING BY EXAMPLE

Dhaka is investing in green factories. Recently two eco-factories for textiles began construction, and several more are in initial planning stages. Bangladesh Green Building Council (BGBC) was founded in 2011, and is the national representative for Bangladesh on the World Green Building Council. Supported by United Nations Framework Convention on Climate Change (UNFCCC) and Intergovernmental Panel on Climate Change (IPCC) fellows, the council provides a centralized national board for green building certifications, courses and outreach, consultancy services to private construction firms, and government initiatives within Bangladesh. The nation now has over 19,000 square meters of LEED certified space, all built since the founding of BGBC in 2011. Dhaka South City Corporation has taken the initiative of greening its headquarters.¹

AFFORDABLE HOUSING

Dhaka's affordable housing system provides housing to government workers in the form of readymade apartments, independent houses, or duplex housing units, which are allocated based on income level. Demand continues to out pace supply for green buildings in Dhaka. The public housing system also supplies housing targeted to low-income and middle-income groups.

CITY EMISSIONS TARGET:

No emissions target is currently available for Dhaka.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✗
New/Existing Commercial Building Incentives	✗
New/Existing Residential Building Incentives	✗
Green Schools	✓
Neighborhood-Scale Sustainability	✗

CITY DETAILS - ENTIRETY OF DHAKA

Population	14.4 million
Land Area (km ²)	815.8
Gross Domestic Product (in USD billions)	--
Average Walk Score ²	80/100
Annual Rainfall (mm/year)	1,854
Climate Action Plan	Yes (National)

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e)	--
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Bangladesh) ³	5
---	---

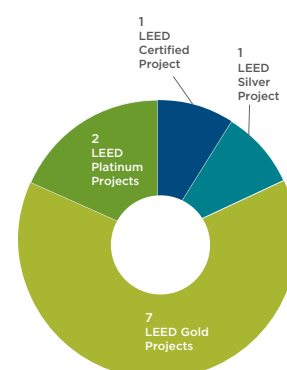
PROJECT BREAKDOWN

3
LEED Certified
Projects (Dhaka)

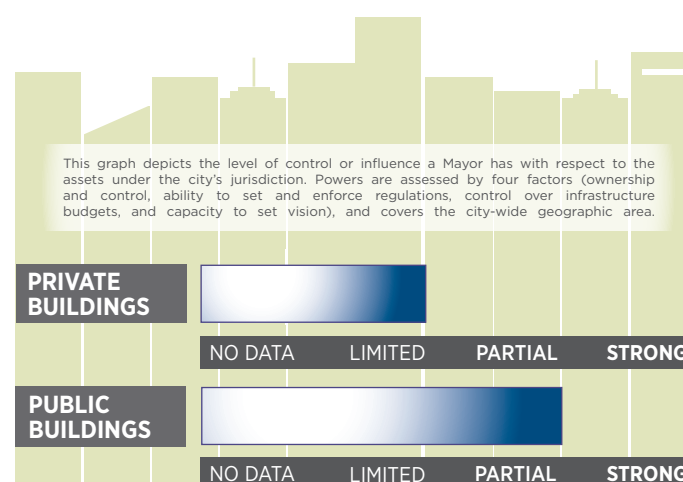
37
LEED Registered
Projects (Dhaka)

11
LEED Certified
Projects (Bangladesh)

62
LEED Registered
Projects (Bangladesh)



Graph depicts the distribution of LEED certified projects in Bangladesh

MAYORAL POWERS

GREEN CODES

The Bangladesh National Building Code (BNBC) is currently being upgraded by the Bangladesh University of Engineering & Technology (BUET) and is in its final stage of review. The latest version of the building code will include sections on sustainability and green design. Current building codes state that:

- New construction projects on land over 300 square meters are to have facilities for conserving and harvesting rainwater
- Clause 1.17.1 of the General Building Guidelines require that all rooms and interior spaces designated for human occupancy are to have natural or artificial lighting and natural or mechanical ventilation

GREEN SCHOOLS

Dhaka has a strong record of sustainable school design. Schools in Bangladesh have adopted passive cooling and are mostly constructed with local materials, reducing the buildings' carbon footprint during construction.

GREEN ROOFS

The last few decades of urbanization and high population growth in Dhaka has caused a significant decline in agricultural lands, green spaces, and access to potable water due to the increasing density and growth of the city limits into surrounding agricultural land. The green roof revolution is just beginning in Dhaka – there are now green roofs on institutional, hospital, commercial, and residential developments. While the number is still small, the movement is gaining popularity as it solves several common challenges, including reducing the energy requirements of buildings by acting as a natural cooling system, and increasing local food security by supplying fresh fruit and vegetables. Rainwater harvesting is also growing in popularity, reducing the significant problem of stormwater runoff and increasing local water security. Dhaka South City Corporation has mandated that at least 50% of roof area be green for new construction above ten stories.⁵

SUSTAINABLE COMMUNITIES

Dhaka's Integrated Solid Waste Management Master Plan is a comprehensive 10-year plan targeted at reducing waste generation and improving overall waste management in the capital city. The plan aims to manage municipal solid waste throughout its life-cycle, reduce greenhouse gas emissions, and encourage public and private sector participation. It is based on the improvement of three key operations items – Reduce, Reuse and Recycle – with a strong emphasis on raising public awareness, and a significant upgrade of the existing collection assets and sanitary landfills. Through the plan, Dhaka hopes to collect and treat at least 68% of the waste produced in the inner metropolitan area, which would mean an accumulated 180% increase in collection and final disposal efficiency in comparison to 2005's 44% collection rate.⁶

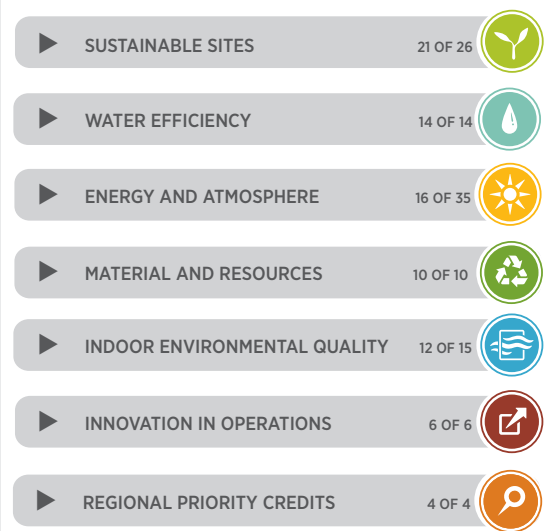
PROJECT SPOTLIGHT:

Genesis Washing Factory

The Genesis Washing factory achieved a Platinum rating under the LEED for Existing Buildings rating system in August 2013. The building's design resulted in a 30% reduction in indoor potable water use and a 100% reduction in potable water used for landscaping, both against a modeled baseline. Ongoing consumables associated with the facility are reused, recycled, or composted at a rate of 50%. The structure also achieved a 79 ENERGY STAR® Performance Rating.⁷

LEED Scorecard

Platinum 83/110



REFERENCES

1. Institute for Building Efficiency: Green Building Rating Systems: Bangladesh: <http://bit.ly/1xaXVEg>.
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3. LEED Professionals and Project Figures were retrieved on 6 January 2015.
4. Bangladesh National Building Code: <http://buildingcode.gov.bd/>.
5. Bangladesh University of Engineering and Technology: Green Roof Concept for Eco-Sustainability in the Context of Urban Dhaka: http://www.academia.edu/6084128/Green_Roof_Concept_for_Eco-Sustainability_in_the_Context_of_Urban_Dhaka.
6. City Climate Leadership Awards: Dhaka: Integrated Solid Waste Management Plan: <http://cityclimateleadershipawards.com/2014-project-dhaka-water/>.
7. USGBC: Directory: Projects: Genesis Washing Ltd.: <http://www.usgbc.org/projects/genesis-washing-ltd>.

GREEN BUILDING CITY MARKET BRIEF

KARACHI

PAKISTAN



A CITY-WIDE MOVEMENT

The creation of the Pakistan Green Building Council (PGBC) in 2012 was a defining moment for Pakistan in its efforts to modernize the building industry. The initiative started in 2009 and was made a reality in 2012, officially joining the Securities and Exchange Commission. As a testament to its respect for the industry, PGBC will deem the first 50 registered buildings as 'Pakistan GBC first' buildings, recognizing their leadership in energy efficiency and building design.

LEADING BY EXAMPLE

Pakistan was an early adopter of building energy benchmarking. The National Environmental Quality Standard (NEQS) of Pakistan was introduced in 2001, requiring buildings to self-monitor their energy efficiency and other green building metrics.²

AFFORDABLE HOUSING

The Pakistan Straw Bale and Appropriate Building (PAKSAB) group has trained employees and built affordable straw bale houses in northern Pakistan in response to earthquake hazards. PAKSAB house designs utilize passive solar, rainwater catchment, solar lamps, high-efficiency cooking and heating, and the use of natural building materials such as light straw clay, wattle and daub, as well as cob.²

GREEN OFFICES

WWF Pakistan's Green Office Initiative aims to help buildings reduce their burden on the environment, while achieving savings. Its underlying goal is to reduce carbon emissions from office buildings. Offices meeting the program criteria are given the designation of Green Offices.³

CITY EMISSIONS TARGET:

No emissions target is currently available for Karachi.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✗
New/Existing Commercial Building Incentives	✗
New/Existing Residential Building Incentives	✗
Green Schools	✓
Neighborhood-Scale Sustainability	✗

CITY DETAILS

Population	23.5 million
Land Area (km ²)	3,527
Gross Domestic Product (in USD billions)	78
Average Walk Score ⁴	47/100
Annual Rainfall (mm/year)	167.6
Climate Action Plan	No

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e)	--
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

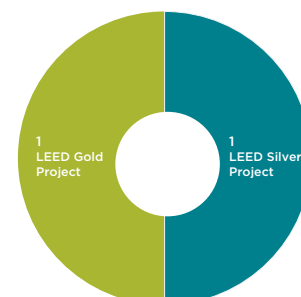
MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Pakistan) ⁵	18
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PROJECT BREAKDOWN

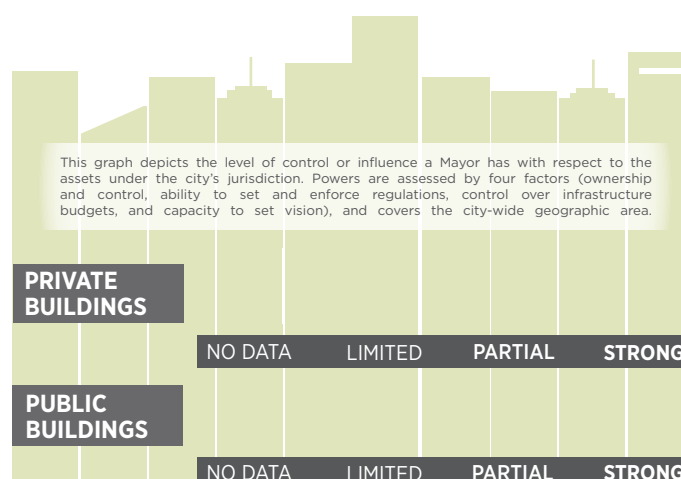


- 2 LEED Certified Projects (Karachi)
- 9 LEED Registered Projects (Karachi)
- 2 LEED Certified Projects (Pakistan)
- 19 LEED Registered Projects (Pakistan)



Graph depicts the distribution of LEED certified projects in Pakistan

MAYORAL POWERS



GREEN CODES

The Sindh Building Control Authority (SBCA) is responsible for building codes within the Sindh province; including the city of Karachi. The base codes for SBCA was established in April of 2002, and the government has since created several revisions related to sustainability measures. Chapter 10 of the SBCA building code requires that every room have access to natural lighting and natural ventilation. The National Environmental Quality Standards (NEQS) supplements the Sindh Building Control Authority and building policies of the Sindh government.⁶

GREEN SCHOOLS

In 2010, WWF Pakistan launched its Green Schools Program. The program aims to enhance public awareness by engaging students in environmental education activities. Activities include intra-school green competitions, eco workshops, an annual nature carnival, and community service opportunities. In its pilot stage, the program involved 10 schools. The program has since expanded with over 1,200 students now participating.⁷

RETROFITS

Earthquakes area a significant risk in Karachi and the impacts are exacerbated by ad hoc developments that have been hastily built to meet the increasing demands of a rapidly expanding population. Efforts are now being made to retrofit existing residential buildings to increase their seismic resiliency. NED University of Engineering (NED) and Technology and Geohazards International (GHI) project teams are assessing and designing seismic retrofits for existing buildings in Karachi, an important step in increasing building safety and resiliency in Karachi. The teams are also improving the earthquake engineering curriculum, providing professional training for Pakistani engineers, and strengthening cooperative research and professional relationships between Pakistani and American researchers.⁸

SUSTAINABLE COMMUNITIES

Karachi is making strong progress on urban sustainability, expanding public green spaces and overhauling the inadequate public transport system. In 2009, the government launched the Green Karachi Project which aims to turn hundreds of acres of waste land in the city into lush parks and massive tree plantations along 24 major roads traversing through the city. Under the project around 20 million saplings will be planted in Karachi.

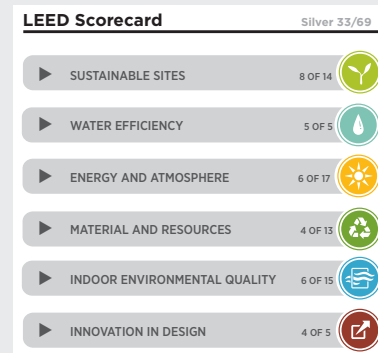
The project is intended to reduce the urban heat island effect, create green recreational spaces for the local community, reduce stormwater runoff and offset GHG emissions.

The Pakistan Sustainable Transport Project is a cooperative venture between the UN Development Programme and Pakistan. It seeks to provide technical assistance to reduce energy consumption and greenhouse gas emissions associated with the nation's transportation sector, while simultaneously improving urban environmental conditions and trade competitiveness. The project is forecasted to be completed in 2016.⁹

PROJECT SPOTLIGHT:

NCC Karachi

NCC Karachi achieved Silver certification under the LEED for New Construction rating system in June 2014. The building's design resulted in a 50% reduction in potable landscape water use and a 20% reduction in baseline indoor water use, both against a modeled baseline. The building also experienced a 24.5% improvement on a baseline for building energy performance.¹⁰



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2. Pakistan Straw Bale and Appropriate Building: Projects: <http://www.paksbab.org/html/index.php?id=4>.
3. WWF Pakistan: Green Offices: <http://www.wwfpak.org/greenoffice/>.
4. Walk Score measures the walkability of a city by measuring community connectivity and pedestrian friendliness. Walk Score's methodology is available at <http://walkscore.com/methodology.shtml>.
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6. Sindh Building Control Authority: About Us: http://sbca.gos.pk/about_us.aspx.
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9. IUCN: Pakistan Sustainable Transport Project: https://www.iucn.org/about/union/secretariat/offices/asia/asia_where_work/pakistan/projects/proj_pakstran/.
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GREEN BUILDING CITY MARKET BRIEF

MUMBAI

INDIA



STATE AND NATIONAL ENCOURAGEMENT OF GREEN BUILDING

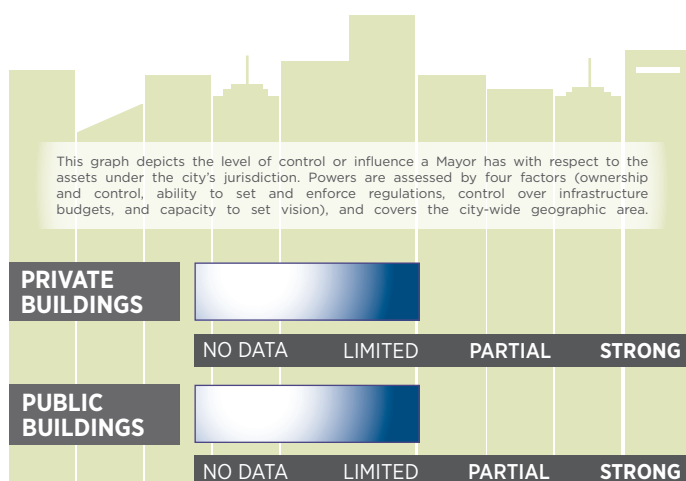
Buildings seeking to receive environmental clearance from the Expert Appraisal Committee, state or national, will receive priority if they have obtained a green building certification with a reputable standard; including pre-certified and provisionally certified structures. The National Action Plan on Climate Change was released in June of 2008, through the Prime Minister's Council on Climate Change. The plan includes eight missions spanning through 2017 that will help decrease the nation's greenhouse gas emissions, including: solar mission, mission for enhance energy efficiency, mission on sustainable habitats, water mission, mission for sustaining the Himalayan ecosystem, mission for a green India, mission for sustainable agriculture, and mission on strategic knowledge on climate change.

GRIHA has been adopted as the national rating system for green buildings by the Ministry of New and Renewable Energy (MNRE). It is mandatory for all new public sector projects to achieve at minimum a 3 Star GRIHA rating.

CITY-LEVEL POLICIES PRESENT

CITY-LEVEL POLICIES PRESENT	
Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✗
New/Existing Residential Building Incentives	✗
Green Schools	✓
Neighborhood-Scale Sustainability	✗

MAYORAL POWERS



CITY DETAILS

Population	12.48 million
Land Area (km ²)	603
Gross Domestic Product (in USD billions)	160
Average Walk Score ¹	95/100
Annual Rainfall (mm/year)	2,258
Climate Action Plan	No

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e)	--
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (India) ²	571
--	-----

PROJECT BREAKDOWN



52
LEED Certified
Projects (Mumbai)

81
LEED Registered
Projects (Mumbai)

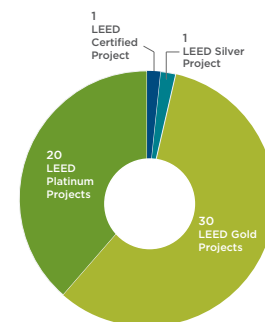
279
LEED Certified
Projects (India)

384
LEED Registered
Projects (India)

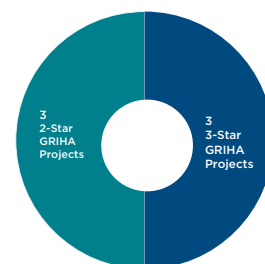
6
GRIHA Certified
Projects (Mumbai)

50
GRIHA Registered
Projects (Mumbai)

64
GRIHA Certified
Projects (India)



Graph depicts the distribution of LEED certified projects in Mumbai



Graph depicts the distribution of GRIHA projects in Mumbai

CITY EMISSIONS TARGET:

India has pledged to reduce its carbon intensity by 20-25% by 2020, compared to 2005 numbers.

LEADING BY EXAMPLE

India's Perform, Achieve, and Trade (PAT) Scheme is the second cap-and-trade initiative in Asia to test the market. The plan is slated to reduce 26 million tons of CO₂ by 2015 and contribute to national target reductions of 20-25% in carbon intensity levels from 2005 by 2020. The PAT Scheme sets plant specific targets instead of sector targets, providing each building owner with a baseline CO₂ emissions figure and the reductions being made from the baseline.

GREEN CODES

The National Ministry of Environment and Forest requires environmental clearance for construction projects. However, as of June 2011, projects that have been built by integrating a high level of environmental norms into their building plans will receive out-of-turn clearance from the ministry.

The Energy Conservation Building Code, released in 2007, sets minimum energy standards for the design and construction of new commercial buildings that have a connected load in excess of 100 kW. Compliant buildings will see an energy savings of 25-40%.³

SUSTAINABLE COMMUNITIES

The Mumbai Sustainability and Corporate Citizenship Protocol was developed in a cooperative effort by the Jamnalal Bajaj Institute of Management Studies, and the Asian Centre for Corporate Governance & Sustainability and was presented by the Maharashtra Minister for Finance and Planning. The protocol calls for measures to be taken regarding water conservation, air pollution, waste management, and social equality. Some of the proposed actions include developing a new, more efficient transportation infrastructure, promoting the adoption of environmentally sound technologies, recycling and reuse of materials, as well as taking steps towards developing a low carbon economy.⁴

In June 2012, the eco-city project began in Navi Mumbai. It is being managed jointly by the Navi Mumbai Municipal Corporation and The Energy and Resources Institute (TERI). It is a unique, program-based approach for integrating resource-friendly concepts for making Navi Mumbai an eco-city of India. It cuts across three major sectors: residential, industrial, and the government. The project is implemented as a public-private partnership model.

The project is planned to be completed in two phases, spanning three years. Phase 1 focuses on estimating city-level carbon emissions and preparing a comprehensive action plan for the implementation of the project. Phase 2 centers around the implementation of the project. Outreach and awareness generation is also a focal point of phase 2.⁵

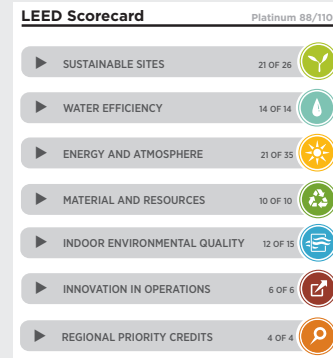
GREEN SCHOOLS

Green Schools Mumbai is a program that works with school children in the city to create kitchen gardens to increase the students' understanding of how their actions impact the environment. Through this project students learn valuable sustainability techniques such as recycling and harvesting rainwater, pest control without chemicals, as well as composting.⁶

PROJECT SPOTLIGHT:

Hotel ITC Maratha

Mumbai's Hotel ITC Maratha achieved Platinum certification under the LEED for Existing Buildings in March 2011. The building's design resulted in a 30% reduction in indoor potable water use and a 100% reduction in potable water used for landscaping purposes, both against a modeled baseline. Construction and demolition debris associated with the project was diverted from landfills at a rate of 70%. The building also achieved a 76 ENERGY STAR® Performance Rating.⁷



REFERENCES

1. Walk Score measures the walkability of a city by measuring community connectivity and pedestrian friendliness. Walk Score's methodology is available at <http://walkscore.com/methodology.shtml>.
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4. Government of Maharashtra: Mumbai Sustainability and Corporate Citizenship Protocol: http://www.asiancentre.org/Mumbai_Sustainability_and_Corporate_Citizenship_Protocol_N1.pdf.
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EAST ASIA

- ▶ BEIJING
- ▶ CHANGWON
- ▶ HONG KONG
- ▶ SEOUL
- ▶ SHANGHAI
- ▶ SHENZHEN
- ▶ TOKYO
- ▶ YOKOHAMA

- ▶ NORTH AMERICA
- ▶ CENTRAL & SOUTH AMERICA
- ▶ EUROPE
- ▶ AFRICA
- ▶ SOUTH & WEST ASIA
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- ▶ SOUTHEAST ASIA & OCEANIA

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GREEN BUILDING CITY MARKET BRIEF

BEIJING

CHINA



A NATIONAL MOVEMENT

China's 12th Five Year Plan (2011-2015) acknowledges the environmental benefits of sustainable design and construction and aims to use green buildings as a means to reduce energy use by 16% and carbon intensity by 17% below 2010 levels by 2015.

In an effort to define green buildings within China, the Chinese Building Science Research Institute developed the China Green Building Label, or Three-Star Rating System, as it is commonly known, in 2006. The Three-Star Rating System is managed by the Ministry of Housing and Urban-Rural Development (MOHURD) and projects are certified by the China Green Label Office at the China Green Technology Centre. MOHURD has also authorized universities and local municipalities to award one-star or two-star ratings. Under the 12th Five Year Plan, two-star buildings are awarded 45 Yuan per square meter and three-star buildings are awarded 80 Yuan per square meter.¹

LEADING BY EXAMPLE

As of June 2013, all new buildings, both public and private, constructed in Beijing must achieve a one-star rating under the China Green Building Label.²

During the period of the 12th Five Year Plan from 2011 to 2015, Beijing plans to construct at least ten ecological demonstration zones. All buildings within these ecological demonstration zones must meet one-star certification, with at least 40% of the buildings achieving a two-star level or higher.

SUSTAINABLE COMMUNITIES

In 2008, the year of the summer Olympics, Beijing became China's first city to adopt Euro IV standards, setting the acceptable limits of vehicle exhaust emissions. In 2013, the city increased this compliance level to the Euro V standards.

Beijing aims to have green areas covering 30% of total land area in a given community. Also, for 80% of the communities in the Chinese capital, residents should be within a 300 meter walking distance to the closest bus stop and no more than 500 meters from the nearest subway access.

NATIONAL EMISSIONS TARGET:

Under the 12th Five Year Plan, China vowed to reduce carbon intensity by 17% below a 2005 baseline by 2015.

CITY-LEVEL POLICIES PRESENT

CITY-LEVEL POLICIES PRESENT	
Green Building Codes	X
Energy Benchmarking and Data Transparency	X
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	X

CITY DETAILS

Population	21.15 Million
Land Area (km ²)	16,410
Gross Domestic Product (in USD billions) ³	427.2
Average Walk Score ⁴	67/100
Annual Rainfall (mm/year)	557
Climate Action Plan	No

BUILDING PERFORMANCE

EMISSIONS

City-wide Emissions (metric tons CO ₂ e)	--
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (China) ⁵	1,662
--	-------

PROJECT BREAKDOWN



1,640
China Green Building Design
Label Rated Buildings (China)



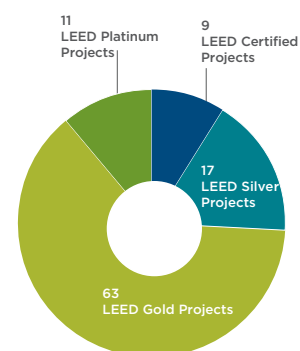
144
China Green Building
Performance Label Rated
Buildings (China)

100
LEED Certified Projects
(Beijing)

159
LEED Registered Projects
(Beijing)

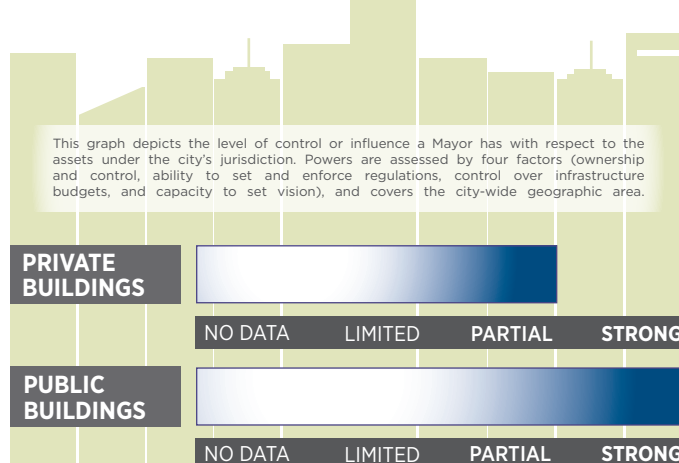
554
LEED Certified Projects (China)

1,315
LEED Registered Projects
(China)



Graph depicts the
distribution of LEED
certified projects in Beijing

MAYORAL POWERS



POLICY SPOTLIGHT:

POLICY NAME:

As of June 2013, all new buildings, both public and private, constructed in Beijing must achieve a one-star rating under the China Green Building Label.

GREEN RESIDENTIAL BUILDINGS

In May 2012, the Ministry of Finance and Housing Department for the People's Republic of China proclaimed that by 2014, all newly constructed government low-income housing must be Chinese Green Building Label certified.

In July 2013, the city of Beijing announced its goal to reduce energy consumption in residential buildings by 75%.⁶

GREEN SCHOOLS

The "Sunshine Schools" program, started in September 2012, is expected to install solar photovoltaic (PV) systems in roughly 1,000 public schools across Beijing, making it China's largest rooftop solar PV project in the public sector to date.⁷

China's investment in the generation of solar power is expected to reach 250 billion Yuan during the period of the 12th Five Year Plan.

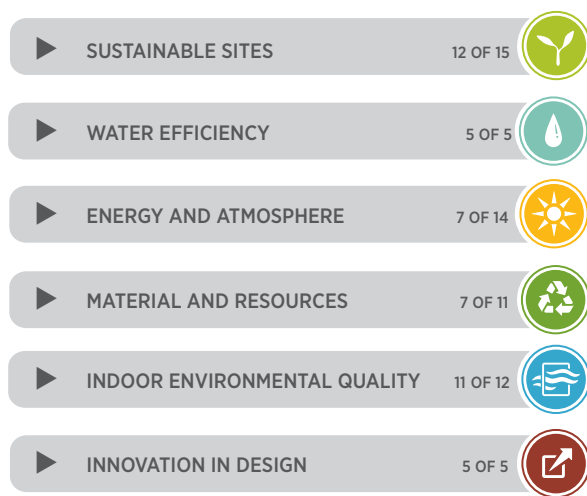
PROJECT SPOTLIGHT:

World Financial Centre, Beijing

The World Financial Center was certified LEED Platinum under the Core & Shell rating system 2.0 in November 2010. The building has a green power purchase rate of 35%. Half of the wood used for the project was certified by the Forest Stewardship Council (FSC). The building design resulted in a 50% reduction in wastewater generation.⁸

LEED Scorecard

Platinum 47/62



PROJECT SPOTLIGHT:



Photograph Courtesy of Parkview Green Beijing

Parkview Green Beijing

Parkview Green Beijing achieved a Platinum rating under LEED Core and Shell 2.0 in February 2013. The mixed-use project generates 31.5% renewable energy onsite and has a 35% green power purchase rate. There was also a 50% reduction in wastewater generation; rainwater is collected and used for irrigation purposes.⁹

LEED Scorecard

Platinum 55/62



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GREEN BUILDING CITY MARKET BRIEF

CHANGWON

REPUBLIC
OF KOREA

Changwon is a city with a rich history of environmental awareness. It was declared an environmental capital by the South Korean National Government on November 2, 2006. In October 2008, the city was host to the 10th Ramsar Convention. More recently, in 2012, Changwon received the Presidential Award, the highest achievement possible, at the EcoRich City Competition. The contest was sponsored by the Presidential Committee on Green Growth.¹

LEADING BY EXAMPLE

South Korea's Ministry of Knowledge and Economy constructed the Changwon Solar Tower at the Marine Solar Park in Myeong-dong, Jinhae-gu, Changwon. It is the tallest solar photovoltaic power generating building in the country, with a height of 136 meters. The opening ceremony was held on March 25, 2013. The shore-adjacent building was designed to look like a massive sailing ship to attract visitors. The large structure is capable of generating 1,264kW of electricity each day. Below the solar tower is an exhibition floor that can hold 500. This exhibition floor not only has information about the solar tower, but also outstanding views of the East China Sea. It is hoped that this project will influence other governments and industries to take similar action in creating renewable energy sources.²

GREEN RESIDENTIAL HOUSING

The Changwon City Government implemented the Carbon Mileage System - an energy efficiency point system, wherein households or companies earn points for their water and energy savings. The government incentivizes the program by providing cashback, coupons for various goods, and Nubija rewards (Changwon Bike-Share Program). The more points a household or company earns, the more goods or cash they can receive; points are calculated by the city government. In 2013, ninety-thousand households participated in the program, contributing to an estimated CO₂ reduction of 7,580 tons for that year. The number of households participating has increased by fifteen thousand from 2012.³

CITY EMISSIONS TARGET:

The Changwon City Government plans to reduce their greenhouse gas emissions by 30% by 2020, compared with 2005 numbers.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	X
Energy Benchmarking and Data Transparency	X
Green Municipal Buildings	X
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	X

CITY DETAILS

Population	1,089,406
Land Area (km ²)	736.34
Gross Domestic Product (in USD billions)	--
Average Walk Score ⁴	23/100
Annual Rainfall (mm/year)	1,545
Climate Action Plan	No

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁵	6,300,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Korea) ⁶	829
--	-----

PROJECT BREAKDOWN

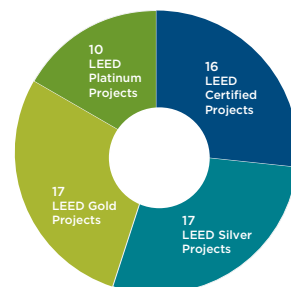


2
LEED Certified
Projects (Changwon)

0
LEED Registered
Projects (Changwon)

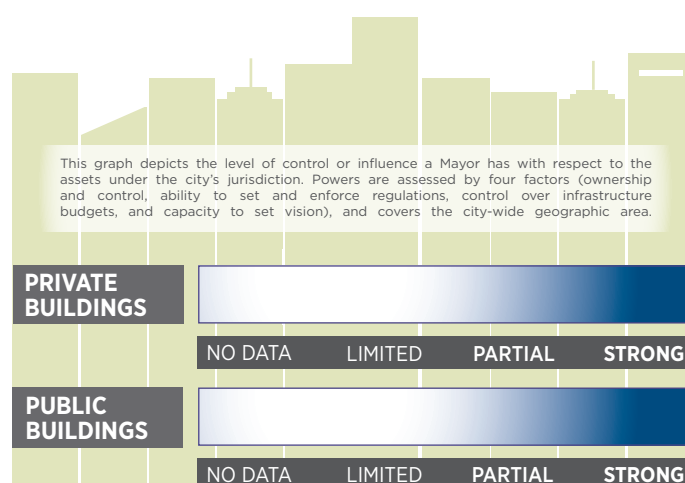
60
LEED Certified
Projects (Korea)

201
LEED Registered
Projects (Korea)



Graph depicts the distribution of LEED certified projects in Korea

MAYORAL POWERS



POLICY SPOTLIGHT:

The city has designated an energy reduction task force to meet once a week to review numbers from various industrial sectors and government departments. The task force will allot reduction goals to each department. The implementation of the “Carbon Mileage System” will only further assist Changwon in meeting, and perhaps surpassing, its goals by rewarding citizens that reduce consumption levels with voucher or cashback incentives based on their carbon mileage for the year.⁷

GREEN SCHOOLS

It is currently a national requirement that all new government, education, and commercial buildings be constructed to meet the Korean Green Building Certification Criteria (KGBCC). The KGBCC consists of a standard set of requirements for schools as well. The South Korea K-12 e-Green Initiative aims to foster young environmental leaders, and empower students and educators across the subject of environmental science. Changwon's school system has an annual Green Day where students are engaged on local issues regarding the city's sustainable practices.⁸

SUSTAINABLE COMMUNITIES

Changwon is seeking to have bicycle usage reach 20% of the city's transportation share by 2020. The city plans to reduce road width in order to create more bike-lanes throughout the city. This will alleviate the issue of citizens riding bikes on the wide sidewalks intended only for pedestrian use. To foster interest in commuting by bike, Changwon will host different types of events focused around biking.

The Changwon City Government introduced a bike-share program called Nujiba (Nearby Useful Bike Interesting Joyful Attraction). It is an affordable program costing 20 USD per year. To encourage their use and provide users with a sense of empowerment the bikes are fitted with computers that track and show user data. As this program continues to expand, savings on fuel costs and emissions reductions will continue to increase.⁹

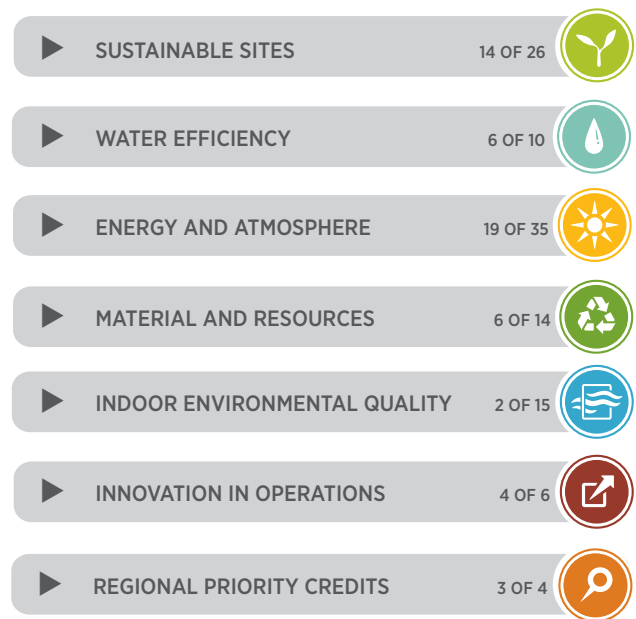
PROJECT SPOTLIGHT:

Samsung Techwin Energy Equipment Plan

Samsung's Changwon plant achieved Silver certification under the LEED for New Construction rating system in December 2010. The building's design resulted in a 40% reduction in baseline indoor water use and a 50% reduction in wastewater generation, both against a modeled baseline. 20% of materials used in the project were extracted, harvested, recovered, or manufactured within a 500 mile radius of the building site.¹⁰

LEED Scorecard

Silver 54/110



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GREEN BUILDING CITY MARKET BRIEF

HONG KONG

SPECIAL ADMINISTRATIVE
REGION OF THE PEOPLE'S
REPUBLIC OF CHINA

A CITY-WIDE MOVEMENT WITH GLOBAL REACH

Hong Kong is a leader in the green building movement, through policies that promote energy efficiency and environmentally-sound practices. As part of the international community for a sustainable built environment, the HKGBC is connecting the city with the world, as an Established Member of the World Green Building Council and with a representative on its Board of Directors. Additionally, Hong Kong will be the host for the World Green Building Council Congress in 2015.

LEADING BY EXAMPLE

Hong Kong's integration of a local green building rating system into the building plan processing regime has accelerated the growth of sustainable design and construction within the city. In 2011, the city implemented a BEAM Plus certification requirement for developers seeking additional project floor area. This area concession is generally capped at 10%. Since the implementation of the new requirement, over 250 new building projects have registered for the BEAM Plus assessment.

The buildings sector accounts for approximately 90% of total electricity consumption in Hong Kong.

GREEN CODES

Launched in October 1998, the Building Energy Codes stipulate compliance standards for the Hong Kong Special Administrative Region of China. In September 2012, the Government made the codes mandatory by enacting the Buildings Energy Efficiency Ordinance, requiring building service installations, including electrical, air-conditioning, lighting, elevators and escalators, in new construction and major renovation projects to meet minimum energy efficiency requirements. Additionally, commercial building owners must conduct an energy audit of the aforementioned building services every 10 years. Energy audit forms must be displayed in a conspicuous location near the main entrance for public view.

CITY EMISSION TARGET:

The City of Hong Kong aims to reduce its carbon intensity by 50-60% below 2005 levels by 2020.

PROJECT TYPE AND PRESENCE

PROJECT TYPE AND PRESENCE	
Green Building Codes	✓
Energy Benchmarking and Data Transparency	✓
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	7.22 Million
Land Area (km ²)	1,104
Gross Domestic Product (in USD billions)	272
Average Walk Score ¹	92/100
Annual Rainfall (mm/year)	2,850
Climate Action Plan	Yes

BUILDING PERFORMANCE

EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ²	42,700,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

BEAM Professionals ³	2,323
BEAM Assessors	36
LEED Credentialed Professionals ⁴	885

PROJECT BREAKDOWN

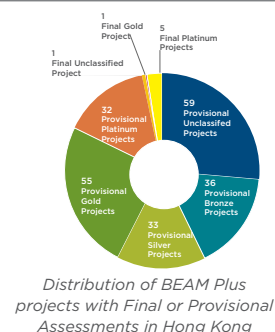


222
BEAM Plus Projects with Final or Provisional Assessment⁵
(Hong Kong)

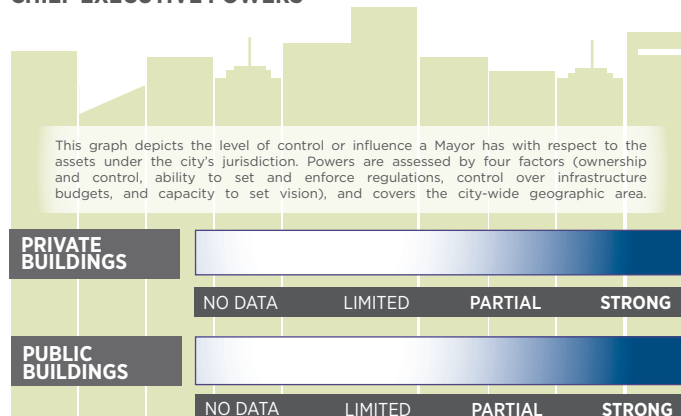
615
BEAM Plus Registered Projects
(Hong Kong)

89
LEED Certified Projects
(Hong Kong)

103
LEED Registered Projects
(Hong Kong)



CHIEF EXECUTIVE POWERS



POLICY SPOTLIGHTS:

BLUEPRINT FOR SUSTAINABLE USE OF RESOURCES 2013-2022

The Blueprint serves as a comprehensive list of initiatives that center on a “use less, waste less” approach. Plans include:

- Reduction of the municipal solid waste disposal rate by 40% on a per capita basis by 2022.
- The unveiling of a Food Waste Plan in February 2014 that maps out a comprehensive strategy for the management of such waste, with a view to reduce Hong Kong’s food waste disposal to landfills by at least 40% by 2022.

CLEAN AIR PLAN FOR HONG KONG

The Plan outlines the challenges facing the city and details policies and measures aimed to tackle air pollution problems with a goal of protecting public health. Strategies include:

- Control measures to reduce emissions from local air pollution sources, including motor vehicles, marine vessels and power plants.
- Phasing out heavily polluting pre-Euro IV diesel commercial vehicles by 2019.
- Strengthening collaboration between Guangdong and Hong Kong to address regional air pollution.

PROJECT SPOTLIGHT:

ZCB (the first Zero Carbon Building in Hong Kong)

ZCB is the first Zero Carbon Building in Hong Kong. Developed by the Construction Industry Council in collaboration with the Hong Kong Government, it aims to showcase eco-building design strategies and technologies for low-carbon living. ZCB generates on-site renewable energy from photovoltaic panels and a tri-generation system using biofuel made of waste cooking oil. ZCB exports surplus energy to offset the embodied carbon of its construction process and major structural materials. ZCB has won various recognitions and awards for its innovative design and superb environmental performance and is one of the first projects to achieve a BEAM Plus Provisional Platinum Rating. ZCB offers guided tours to the general public and runs a ZCB Ambassador Scheme for students to educate visitors on low-carbon living.

BENCHMARKING

To improve the overall energy efficiency of buildings in Hong Kong, the HKGBC’s Policy and Research Committee and Industry Standards Committee have been developing two sets of building operational energy benchmarking tools to help building users and property managers identify possible opportunities for improvement. The Building Energy Performance Recognition Scheme – Office Occupants (BESTOO) was launched in November 2013. Aimed to reduce energy consumption, the Scheme and

a web-based energy benchmarking tool were developed to promote energy efficiency and recognise office occupants with outstanding energy saving performance. The energy benchmarking tools for commercial buildings are now under development and are expected to be launched in 2015.

In an effort to reduce the environmental burden of the buildings sector, the HKGBC launched the HK3030 campaign in March 2013, to drive a 30% reduction of absolute electricity consumption in buildings below 2005 levels by the year 2030.

GREEN RESIDENTIAL BUILDINGS

In accordance with the Residential Properties (First Hand Sales) Ordinance, which came into effect in April 2013, when selling first hand residential properties in a development which was granted gross floor area concessions, vendors must provide the environmental assessment results of BEAM Plus certification for the building(s) in the development within the sales brochure. Additionally, the Mandatory Energy Efficiency Labeling Scheme (MEELS) requires that certain household appliances (air-conditioners, refrigerators, compact fluorescent lamps, etc.) display an energy label. While MEELS concentrates on the energy efficiency of home appliances, the Industry Standards and Research Committee of the Hong Kong Green Building Council is developing an eco-labeling scheme for building materials and products to accelerate the development of a sustainable and transparent building supply chain.

GREEN EDUCATION

Guiding Hong Kong school principals and administrators to green their schools, the HKGBC’s Public Education Committee published a ‘Hong Kong Green School Guide’. It provides insight on best practices, current green school initiatives, and project-related costs. Since 2011, the Council has organized “My Green Space Green Building Competition for Schools,” a green building competition that encourages students of local primary and secondary schools to present creative ideas on how green building concepts can be applied to homes, schools, communities and the city. Recognizing the crucial role played by the education sector in nurturing behavioral change, the HKGBC has continuously organized green building tours and workshops for local primary and secondary school communities. Additionally, the Council plans to run its 2nd annual territory-wide public campaign, “Hong Kong Green Building Week,” to promote local green building development and sustainable lifestyles.

GREEN SHOPS

Aiming at providing guidance to the owners, facility managers and tenants of shopping malls and individual shops on implementing measures in their facilities, the Hong Kong Green Shop Guide was launched in March 2014. A seminar targeting stakeholders, including developers, facility managers, shop owners and tenants, was held in April 2014 to encourage the implementation of green projects within the retail sector. To further increase the environmental awareness of the shop owners and tenants and to stress the importance of behavioral change, a total of six exhibitions will take place from March to October 2014 on a roving basis.

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5. This figure has excluded the number of projects certified by the former HK-BEAM scheme - a scheme that operated before establishment of the HKGBC, which exceeded 200 projects.

GREEN BUILDING CITY MARKET BRIEF

SEOUL

REPUBLIC OF KOREA



A CITY-WIDE MOVEMENT

Seoul is a leader in the green building movement, through policies that go above and beyond in promoting energy-efficient and environmentally-sound practices.

LEADING BY EXAMPLE

In April 2012, the Seoul Metropolitan Government launched the "One Less Nuclear Power Plant" (OLNPP) initiative, promoting energy conservation, efficiency and generation within the city. The main goal of the initiative was to reduce the city's energy demand by 2 million tons of oil equivalent by 2014, through both energy savings and energy production from renewable sources. Seoul achieved this goal in June 2014, six months ahead of schedule.

Seoul is now preparing for the second phase of the OLNPP initiative with particular focus and emphasis on realization of energy values. The second phase of the plan will accelerate Seoul's transition to a sustainable city, through enhanced renewable production and energy efficiency, energy welfare by sharing saved energy with the socially vulnerable classes, and community-based governance aided by publicly-available information on energy policy. The ultimate goal of such efforts is to boost the city's electricity self-sufficiency from 4.2% in 2014 to 20% by 2020 and to reduce greenhouse gas emissions by 10 million tons of CO₂ by 2020.

In 2013, the City of Seoul won the Climate Action Leadership Award as part of the World Green Building Council's Government Leadership Awards for its One Less Nuclear Power Plant initiative.

The second phase consists of 90 specific projects across four policy categories—renewable energy production, energy efficiency and savings, green jobs, and community and welfare. The USD\$3.1 billion initiative will be administered from 2014 through 2018, USD\$1.5 billion of which will come from private capital investment, with a projected payback period of 6 to 10 years.

Seoul plans to facilitate the creation of six green clusters, 210 green energy tech shops, 70 cooperatives and social enterprises in a bid to boost the energy industry.

CITY EMISSIONS TARGET:

The City of Seoul aims to reduce greenhouse gas emissions by one million tons of CO₂ below 2011 levels by 2020.

CITY-LEVEL POLICIES PRESENT

CITY-LEVEL POLICIES PRESENT	
Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✗
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	10.4 Million
Land Area (km ²)	605
Gross Domestic Product (in USD billions) ¹	773.9
Average Walk Score ²	98/100
Annual Rainfall (mm/year)	1,404
Climate Action Plan	Yes

BUILDING PERFORMANCE

EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ³	49 million
% of Emissions from the Building Sector	68.5%

ENERGY USAGE

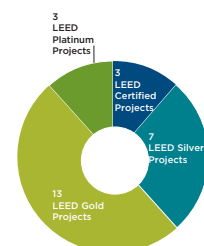
Average Energy Usage/Square Foot	--
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PROFESSIONALS

LEED Credentialed Professionals (Korea) ⁴	829
--	-----

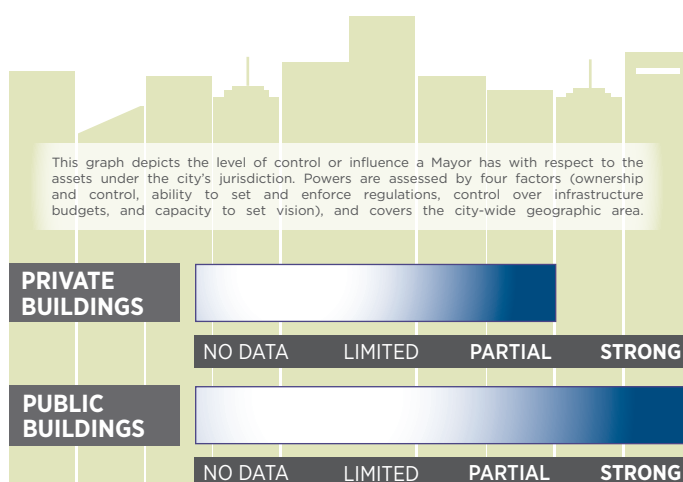
PROJECT BREAKDOWN

	2,551 Korea Green Building Certification Interim Certificates ⁵ (Korea)
	1,372 Korea Green Building Certification Criteria Final Certificates (Korea)
	60 LEED Certified Projects (Korea)
	201 LEED Registered Projects (Korea)



Graph depicts the distribution of LEED certified projects in Korea

MAYORAL POWERS



POLICY SPOTLIGHT:

As part of the One Less Nuclear Power Plant initiative, the “Smart-Lit City” project aims to replace all lighting in department stores, subway stations, underground malls, roads and large buildings with energy efficient LED light bulbs. The Seoul Metropolitan Government is targeting the city’s massive subway network, with a total of 65,000 lights. By the end of 2013, 43,000 lights in subway facilities were exchanged to LED lights, and 22,000 remaining lights on vehicles will be exchanged by the end of 2014.

GREEN BUILDING CRITERIA

In 2002, the national government developed an eco-friendly building certification program for new buildings, which, in 2012, was expanded to include existing office buildings and multifamily housing. In 2013, the certification was renamed, “Korea Green Building Certification,” which is also known as Green Standard for Energy and Environmental Design or G-SEED.

GREEN MUNICIPAL BUILDINGS

Seoul requires public buildings over 3,000 square meters to achieve a premium grade under the Korea Green Building Certification program.

GREEN RESIDENTIAL BUILDINGS

While the national government has set a target to have all new multifamily housing in Korea achieve zero net energy by 2025, the Seoul Metropolitan Government has set 2023 as its target year, two years before the national government.

GREEN SCHOOLS

Seoul provides green education on renewable energy and green vehicles for technical high school students to groom future technical green workers, while the Seoul Business Agency carries out in-depth education on green technology to train professionals.

SUSTAINABLE COMMUNITIES

Beginning in June 2003, Seoul has declared car-free days within the city, which has resulted in a 10% reduction in CO₂ emissions annually. The Seoul Metropolitan Government plans to expand car-sharing as well as deter the use of single-occupancy vehicles to increase this figure.

The City of Seoul aims to be a Global Climate-Friendly City by 2030.

The OLNPP policy includes provisions for community-scale green development and public-transit infrastructure improvements.

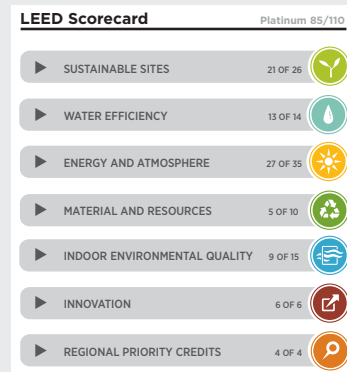
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3. C40 Cities Climate Leadership Group and the Carbon Disclosure Project. (2013) City Data Inventory.
4. LEED Professionals and Project Figures were retrieved on 6 January 2015.
5. Korea Green Building Certification Figures were provided by the Seoul Metropolitan Government on 13 June 2014.

PROJECT SPOTLIGHT:

Seoul Finance Center

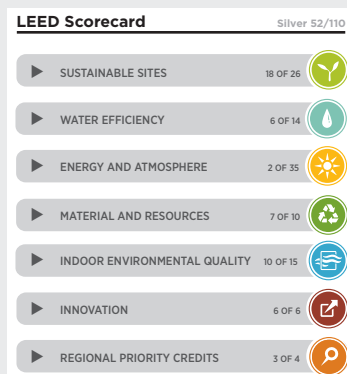
The Seoul Finance Centre was recertified Platinum under LEED for Existing Buildings v2009 in April 2013. The building received a 95 Energy Star Performance Rating and notably achieved a 30% reduction in indoor potable water usage, with no potable water used in landscaping. Additionally, conventional commuting trips were reduced by 75% for building occupants.



PROJECT SPOTLIGHT:

COEX: Convention & Exhibition Center

The COEX building is Seoul’s most popular multifunctional cultural complex with a convention center, exhibition halls, underground shopping mall, aquarium, museums, food courts and a cinema. Through utilizing energy efficient maintenance systems, such as Building Energy Management Systems and Building Automation Systems, recycling water, changing air-conditioning systems, and replacing the previous lightening system with LED bulbs, COEX earned global recognition with a LEED Silver certification in 2011. Each year COEX holds more than 2,000 exhibitions and international conferences, granting the public an opportunity to experience its green building technologies. In addition, COEX promotes sustainable business practices, such as eco-friendly campaigns to save energy and reduce greenhouse gas emissions.



GREEN BUILDING CITY MARKET BRIEF

SHANGHAI

CHINA



A NATIONAL MOVEMENT

China's 12th Five Year Plan (2011-2015) acknowledges the environmental benefits of sustainable design and construction and aims to use green buildings as reduce a means to energy use by 16% and carbon intensity by 17% below 2010 levels by 2015.

In an effort to define green buildings within China, the Chinese Building Science Research Institute developed the China Green Building Label, or Three-Star Rating System, as it is commonly known, in 2006. The Three-Star Rating System is managed by the Ministry of Housing and Urban-Rural Development (MOHURD) and projects are certified by the China Green Label Office at the China Green Technology Centre. MOHURD has also authorized universities and local municipalities to award one-star or two-star ratings. Under the 12th Five Year Plan, two-star buildings are awarded 45 Yuan per square meter and three-star buildings are awarded 80 Yuan per square meter.¹

LEADING BY EXAMPLE

The city of Shanghai has developed its own 12th Five Year Plan. One of the plan's major targets is to strengthen resource conservation and environmental protection. The plan also draws on the motto from the 2010 World Expo, hosted in Shanghai, "Better City, Better Life."

Two-star rated public buildings over 10,000 square meters and three-star rated public buildings over 5,000 square meters receive 60 Yuan per square meter of building area.

BENCHMARKING

Buildings seeking subsidies related to energy efficiency must install sub-metering devices in order to report the energy consumption data to the Municipal Construction and Transportation Committee.

NATIONAL EMISSIONS TARGET:

Under the 12th Five Year Plan, China vowed to reduce carbon intensity by 17% below a 2005 baseline by 2015.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	X
Energy Benchmarking and Data Transparency	X
Green Municipal Buildings	X
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	X

CITY DETAILS

Population	24.15 Million
Land Area (km ²)	6,340
Gross Domestic Product (in USD billions) ²	516.5
Average Walk Score ³	98/100
Annual Rainfall (mm/year)	1,165
Climate Action Plan	No

BUILDING PERFORMANCE

EMISSIONS

City-wide Emissions (metric tons CO ₂ e)	--
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (China) ⁴	1,662
--	-------

PROJECT BREAKDOWN



1,640
China Green Building Design
Label Rated Buildings (China)



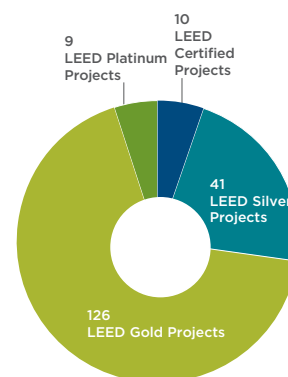
144
China Green Building
Performance Label Rated
Buildings (China)

186
LEED Certified Projects
(Shanghai)

352
LEED Registered Projects
(Shanghai)

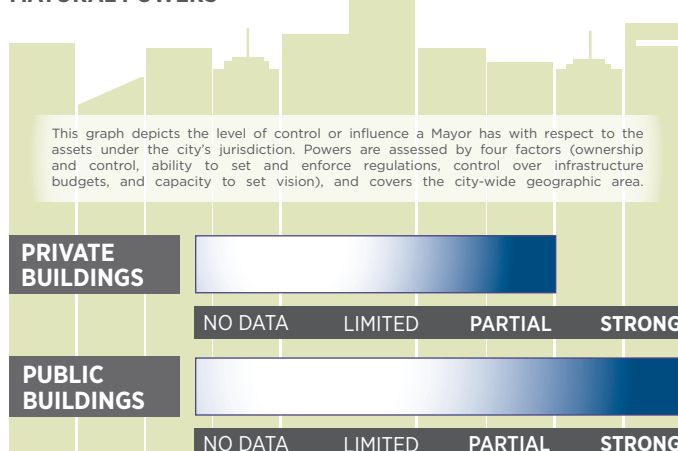
554
LEED Certified Projects (China)

1,315
LEED Registered Projects
(China)



Graph depicts the distribution of LEED certified projects in Shanghai

MAYORAL POWERS



POLICY SPOTLIGHT:

CHINA GREEN BUILDING LABEL SUBSIDIES:

The city of Shanghai offers green building subsidies additional to those available under the 12th Five Year Plan. Two-star rated commercial buildings over 10,000 square meters and three-star rated commercial buildings over 5,000 square meters are eligible to receive 60 Yuan per square meter of building area.

PRIVATE SECTOR INCENTIVES

New construction and retrofitted existing buildings incorporating pre-fabricated designs in 15% or more of the total project area receive a subsidy of 60 Yuan per square meter, which increases to 100 Yuan per square meter in buildings of which 25% or more are prefabricated. On-site renewable energy generation is encouraged through subsidies, including 5 Yuan per watt generated by photovoltaics. Projects that qualify as generating on-site renewable energy may qualify for subsidies up to 10 million Yuan. Additional subsidies for renewable energy are granted based on the type of alternative energy used. Vegetated roofs and walls over 1,000 square meters receive a 30 Yuan per square meter subsidy, while a “special green wall” over 500 square meters receives a 200 Yuan per square meter subsidy. Subsidies are awarded at 150 Yuan per square meter to both residential buildings, 5,000 square meters or more, and public one-story buildings, 10,000 square meters or more, that renovate exterior windows in accordance with requirements in “design standard for energy efficiency of residential buildings” and “public buildings energy-efficient design standards.” Low-income housing projects can qualify for up to 10 million Yuan in subsidies; projects chosen as national demonstration projects can also qualify for these subsidies.

New commercial buildings over 20,000 square meters must have an energy savings of 70% or greater than the standard, while existing commercial buildings over 20,000 square meters must have a savings of 50% or more in order to receive a subsidy of 60 Yuan per square meter of building area.

GREEN RESIDENTIAL BUILDINGS

In May 2012, the Ministry of Finance and Housing Department for the People's Republic of China proclaimed that by 2014, all newly constructed government low-income housing must be Chinese Green Label certified. Additionally, two-star rated residential buildings over 250,000 square meters and three-star rated residential buildings over 10,000 square meters may receive 60 Yuan per square meter of building area.⁵

GREEN SCHOOLS

From 2007 to 2010, the Shanghai Municipal Education Committee along with the Shanghai Health Bureau launched a 100 million Yuan funded project to improve the lighting conditions of 42,125 classrooms in primary and secondary schools. In 2011, the government of Shanghai launched a five year plan titled the “School Health Promotion.” This program focuses on the health of the students and faculty and in many cases deals with the environment around them, including access to clean drinking water and a regimen of at least one hour of physical activity daily.⁶

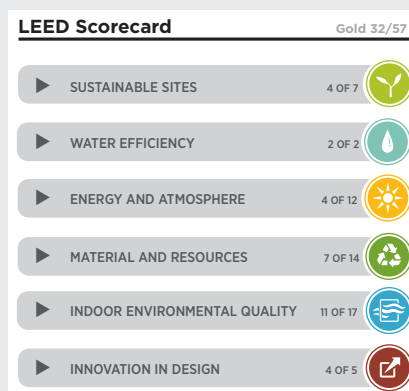
PROJECT SPOTLIGHTS:

Eaton Center Shanghai

Eaton's Asia Pacific Headquarters achieved Gold certification under the LEED for Commercial Interiors Rating System in April 2010, which, at the time, was the largest certified CI project in China. The facility boasts a 34% reduction in water use. 70% of the wood used was certified by the Forest Stewardship Council (FSC). Other features include carpeting made from 100% recycled materials along with 31% of reused furniture and regional materials within 500 miles of the projects location accounted for 76% of the total materials. Nine out of ten seats within the headquarters have daylight and outdoor views.⁷

Azia Center

Shanghai's Azia Center was certified Gold under LEED for Existing Buildings in March 2010. The mixed-use development boasts an 89 ENERGY STAR Performance Rating. The project achieved a 40% sustainable purchasing rate, along with a 10% decrease in potable water usage. Ongoing consumables are reused, recycled or composted at a rate of 50%.⁸



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GREEN BUILDING CITY MARKET BRIEF

SHENZHEN

CHINA



A NATIONAL MOVEMENT

China's 12th Five Year Plan (2011-2015) acknowledges the environmental benefits of sustainable design and construction and aims to use green buildings as a means to reduce energy use by 16% and carbon intensity by 17% below 2010 levels by 2015.

In an effort to define green buildings within China, the Chinese Building Science Research Institute developed the China Green Building Label, or Three-Star Rating System, as it is commonly known, in 2006. The Three-Star Rating System is managed by the Ministry of Housing and Urban-Rural Development (MOHURD) and projects are certified by the China Green Label Office at the China Green Technology Centre. MOHURD has also authorized universities and local municipalities to award one-star or two-star ratings. Under the 12th Five Year Plan, two-star buildings are awarded 45 Yuan per square meter and three-star buildings are awarded 80 Yuan per square meter.¹

LEADING BY EXAMPLE

The city of Shenzhen has developed an extensive system for monitoring environmental quality. Twenty-nine stations around the city constantly measure the air and water for various sources of pollution, including noise pollution.

The Shenzhen Municipal Government's Financial Department is also set to allocate no less than 30 million Yuan of funding per year related to green related projects and activities.²

GREEN RESIDENTIAL BUILDINGS

In May 2012, the Ministry of Finance and Housing Department for the People's Republic of China proclaimed that by 2014, all newly constructed government low-income housing must be Chinese Green Label certified.³

In 2010, the Shenzhen Municipal Government issued mandatory rules to employ specific green building standards for affordable housing projects. From 2010 to 2015 Shenzhen plans to build 240,000 new apartments in accordance with the city's green building standards.

NATIONAL EMISSIONS TARGET:

Under the 12th Five Year Plan, China vowed to reduce carbon intensity by 17% below a 2005 baseline by 2015.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	X
Energy Benchmarking and Data Transparency	X
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	X
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	10,547,400
Land Area (km ²)	1,953
Gross Domestic Product (in USD billions) ⁴	302.4
Average Walk Score ⁵	93/100
Annual Rainfall (mm/year)	1,970
Climate Action Plan	No

BUILDING PERFORMANCE

EMISSIONS

City-wide Emissions (metric tons CO ₂ e)	--
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (China) ⁶	1,662
--	-------

PROJECT BREAKDOWN



1,640
China Green Building Design
Label Rated Buildings (China)



144
China Green Building
Performance Label Rated
Buildings (China)

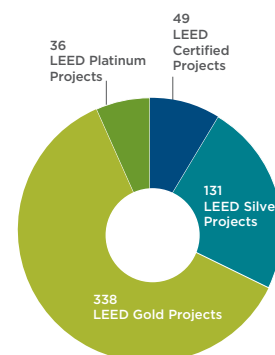


21
LEED Certified Projects
(Shenzhen)

90
LEED Registered Projects
(Shenzhen)

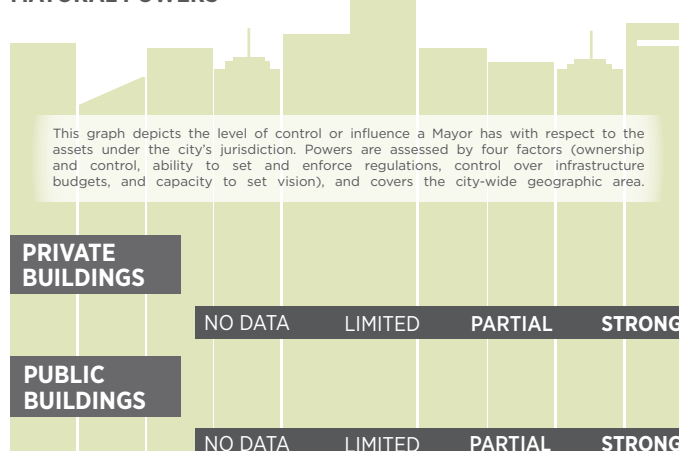
554
LEED Certified Projects (China)

1,315
LEED Registered Projects
(China)



Graph depicts the
distribution of LEED
certified projects in China

MAYORAL POWERS



POLICY SPOTLIGHT:

The Shenzhen Municipal Government set a clear target in various building sectors between 2010 and 2015, to help reach its goal to become a city known for its green building practices. All government-owned and government-funded buildings must achieve basic compliance with green building standards. Public buildings are anticipated to reach a compliance achievement rate of 50%. Industry-wide, the municipality is hoping for a 60% building wastes reutilization rate.⁷

For building reaching China Two-Star or Shenzhen Gold Certification the Shenzhen Municipal Government will award a specified subsidy based on the gross floor area per unit, while the Guangdong Provincial Government will award 25 Yuan per square meter in addition to the National Two-Star subsidy, covering a maximum of 1.5 million square meters per unit. Similarly, if a building reaches China Three-Star Certification, the Shenzhen Municipal Government will cover 100% of the certification fee with an additional subsidy per GFA, while the Guangdong Provincial Government will provide 45 Yuan per square meter, with a maximum of 2 million square meters per unit.

SUSTAINABLE COMMUNITIES

In 2010, representatives from China's Ministry of Housing and Urban-Rural Development, along with the Shenzhen Municipal Government, signed a framework agreement declaring Shenzhen to be China's International Low-Carbon City. The project is a cooperative venture between China and the European Union.⁸

In July 2010, Shenzhen introduced a plan to erect a network of greenways that spans over 2,000 km. The government aims to provide residents with access to a greenway within a five minute walk. 355 km of greenway was constructed by the end of 2010.

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PROJECT SPOTLIGHT:



Photo Credit: Flickr Creative Commons user trevor.patt

The Vanke Center

The Vanke Center, also known as the horizontal skyscraper, earned a LEED Platinum certification following its completion in 2009. It is intended for mixed-use, boasting a hotel, apartments, as well as the headquarters of the Vanke Company. Located underneath the building is a large public green. The Center accommodates a conference center, spa, and a parking garage below ground level. The building was constructed in this manner due to a 35-meter height limit in the area. Instead of constructing several smaller structures the architect wanted to create views of the surrounding landscape and development as well as provide the largest possible amount of green space for the public on the ground level.⁹

LEED Scorecard

Platinum 57/71

▶ SUSTAINABLE SITES	13 OF 14	
▶ WATER EFFICIENCY	5 OF 5	
▶ ENERGY AND ATMOSPHERE	16 OF 17	
▶ MATERIAL AND RESOURCES	5 OF 13	
▶ INDOOR ENVIRONMENTAL QUALITY	13 OF 15	
▶ INNOVATION IN DESIGN	5 OF 7	

GREEN BUILDING CITY MARKET BRIEF

TOKYO

JAPAN



A CITY-WIDE MOVEMENT

For the past decade, the Tokyo Metropolitan Government (TMG) has been a leader in the green building movement. The city's innovative policies go above and beyond in promoting energy efficiency and sound construction and retrofitting practices.

LEADING BY EXAMPLE

The Tokyo Metropolitan Government's **urban cap-and-trade** program for commercial and industrial buildings is the first of its kind in the world. In order to achieve its 25% emissions reduction target by 2020, the city analyzed its carbon footprint by sector, revealing that the buildings sector was by far the greatest contributor to greenhouse gas emissions. The urban cap-and-trade program governs the emissions of 1,400 commercial and industrial facilities, which cover approximately 40% of the sector's emissions. **Most commercial buildings are required to reduce their emissions by 8% (factories 6%) in the first compliance period (2010-2014) and 17% (factories 15%) in the second compliance period (2015-2019).** Buildings that achieve reductions greater than the obligation can sell excess reductions to other buildings.

This program realized a 13% reduction in building CO₂ emissions in the first year and an amazing 23% reduction in the fourth year of operation. The policy preceeding the cap-and-trade program mandated that buildings report benchmarked CO₂ emissions data to the TMG. Each facility's planning report was rated and disclosed according to the program's guidelines.

BENCHMARKING

TMG's Green Building Program rating system ranks buildings from 1 to 3 grades in 12 classifications across four categories. TMG's reporting programs also contain a benchmarking system. This reporting program for small and medium enterprises now encourages buildings to benchmark their performance based on TMG-provided data to promote further energy efficiency.

CITY EMISSIONS TARGET:

The Tokyo Metropolitan Government aims to reduce municipal greenhouse gas emissions by 25% by 2020 below year 2000 levels. Additionally, the city aims to reduce energy consumption by 20% by 2020 below 2000 levels.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✓
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✗
Green Schools	✗
Neighborhood-Scale Sustainability	✗

CITY DETAILS

Population	13.29 Million
Land Area (km ²)	2,178
Gross Domestic Product (in USD billions)	924
Average Walk Score ¹	98/100
Annual Rainfall (mm/year)	1,614
Number of Heating Degree Days	--
Number of Cooling Degree Days	--
Climate Action Plan	Yes

BUILDING PERFORMANCE

EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ²	61,650,000
% of Emissions from the Building Sector	73%
Municipal Emissions (metric tons CO ₂ e)	--

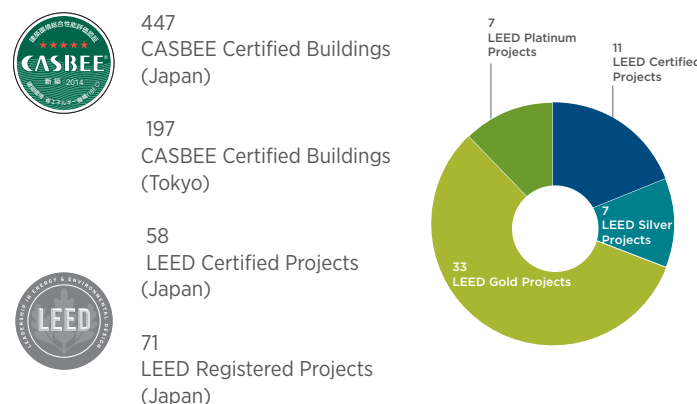
ENERGY USAGE

Average Energy Usage/Square Foot	--
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PROFESSIONALS

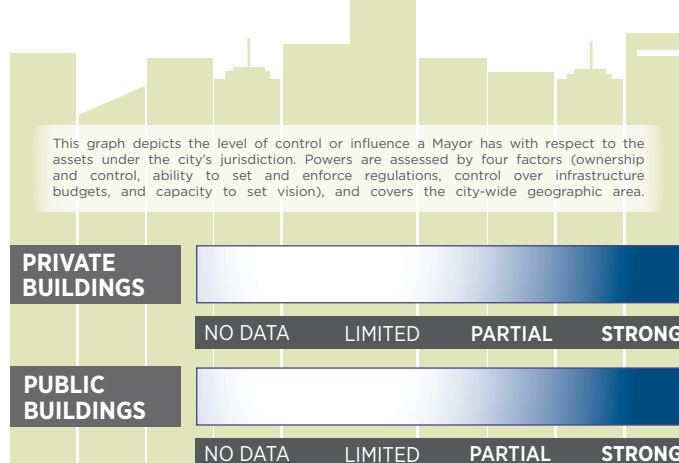
CASBEE Accredited Professionals ³	12,751
LEED Credentialed Professionals (Japan) ⁴	153

PROJECT BREAKDOWN



Graph depicts the distribution of LEED certified projects in Japan

MAYORAL POWERS



POLICY SPOTLIGHT:

TOKYO ENERGY-SAVING PROGRAM:

The Tokyo Energy-Saving Program consists of energy saving measures to be taken throughout the city's building sectors. It aims to transform Tokyo to a low-carbon, highly-resilient metropolis. The plan calls for residents to examine their lifestyles and how their behavior and energy use impact the environment. Through the program, free energy audits are available to low-income residents. TMG's municipal building stock is also targetted under the program. Building energy use in TMG buildings is to decrease by 25%. To achieve this goal, energy management systems and LED lighting will be installed throughout city facilities.

24 Japanese local governments have introduced CASBEE as a building measurement and reporting tool. As of March 2013, 11,096 buildings throughout Japan have participated in CASBEE's benchmarking program.

GREEN HOUSING

The Environmental Labeling Program under the TMG Green Building Program requires new condominiums to measure their environmental performance through a grading system and disclose their rating in advertisements.

DATA TRANSPARENCY

Since 2002, under the city's Green Building Program, more than 2,500 buildings have submitted sustainability plans and disclosed their environmental performance ratings. This program also functions as the minimum energy standard for non-residential buildings, which is stricter than that of the national government.

Over 21,000 small and medium facilities are covered by the mandatory reporting program, and their emissions data is publicly available online. An additional 11,000 facilities submit and disclose their data voluntarily. In January 2010, the Energy Performance Certificate Program established a framework for non-residential buildings, requiring owners to present their buildings' energy efficiency performance data with rated results.

GREEN CODES

TMG's Green Building Program is the flagship measure for green buildings in the city, evaluating structures based on 14 classifications across four categories of 'environmental friendliness':

- Energy Conservation
- Resource Sustainability
- Natural Environment Conservation
- Heat Island Effect Mitigation

Since 2005, the Green Building Program has applied to newly constructed and renovated structures of more than 10,000 square meters and functioned as the minimum energy standard for non-residential buildings, which is stricter than that of the national government. Under the program, buildings can achieve grades between 1 and 3, with 3 being the highest score.

GREEN SCHOOLS

The Action Program for Tokyo Vision 2020 calls for the installation of lawns across Tokyo school playgrounds – aiming for installation in all public schools. The plan also calls for the 'greening of all Tokyo metropolitan schools' using vegetated rooftops, living walls, and open spaces.

PROJECT SPOTLIGHT:

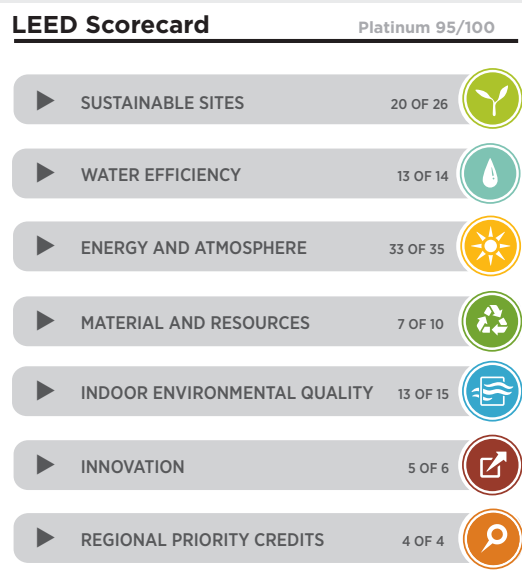


Technical Research Institute, Obayashi Corporation

In October 2013, the Techno-station, Obayashi Technical Research Institute, earned LEED Platinum certification with 95 total points, becoming the **third-highest rated building in the world under LEED for Existing Buildings v2009**. Additionally, the Technical Research Institute boasts a **CASBEE S rating for Existing Buildings**.

The more than 5,500 square meter Technical Research Institute practices sustainable purchasing practices for 60% of all ongoing consumable products and reuses or recycles 75% of all durable goods. The facility also reduced its potable landscape water use by 100%.⁵

To learn more about the Obayashi Corporation, visit their website at <http://www.obayashi.co.jp/english/>.



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GREEN BUILDING CITY MARKET BRIEF

YOKOHAMA

JAPAN



CITY-WIDE MOVEMENT

In 2010, as part of its New Midterm Four-Year Plan, the city of Yokohama, along with five of Japan's largest companies, started the Yokohama Smart City Project. Partners from large industries, including some of the largest energy consumers in Japan, were included as a source of support and funding. In total, it aims to reduce CO₂ emissions by 64,000 tons and introduce 27 MW of renewable energy from photovoltaic systems by 2014. The project is aimed at supporting the development of a Japanese smart-grid-system. Energy management systems are in use by both public and commercial stakeholders, and were introduced in three existing urban communities. The installed systems are capable of centralizing control of energy-consuming features in a particular building or home for increased energy efficiency. Management systems are defined by building use type: business facilities utilize a Building Energy Management System (BEMS); homes utilize a Home Energy Management System (HEMS). Large scale implementation of electric vehicles is also a prominent feature of the Smart City Project. Data regarding the initiative's progress is available to the public.¹

LEADING BY EXAMPLE

The city of Yokohama is setting the example by adopting various low-carbon, energy efficient measures for municipal operations. For instance, the city has undertaken the task of retrofitting public facilities to be more energy efficient. Stormwater management and collection systems have been installed throughout the city. City officials monitor energy consumption and CO₂ emissions in order to determine new strategies that may lead to a reduction in energy intensity. Solar power generators have been installed in several municipal buildings, and the government aims to establish an entity to promote renewable energy. At year's end 2009, 2,945 photovoltaic units had been installed throughout Yokohama.²

CITY EMISSIONS TARGET:

Under the establishment of the Yokohama Anti-Climate Change Action Policy (CO-DO30), targets were established for greenhouse gas reductions. Under the policy, emissions are to decrease by 30% by 2025 and by 80% by 2050, when compared to 1990 levels. Renewable energy production in Yokohama is expected to increase ten-fold compared to 2004 levels.³

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✗
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	3.7 million
Land Area (km ²)	437.4
Gross Domestic Product (in USD billions)	--
Average Walk Score ⁴	97/100
Annual Rainfall (mm/year)	1,629
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁵	19,010,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Japan) ⁶	153
--	-----

PROJECT BREAKDOWN

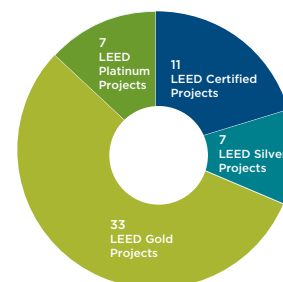


3
LEED Certified
Projects (Yokohama)

1
LEED Registered
Projects (Yokohama)

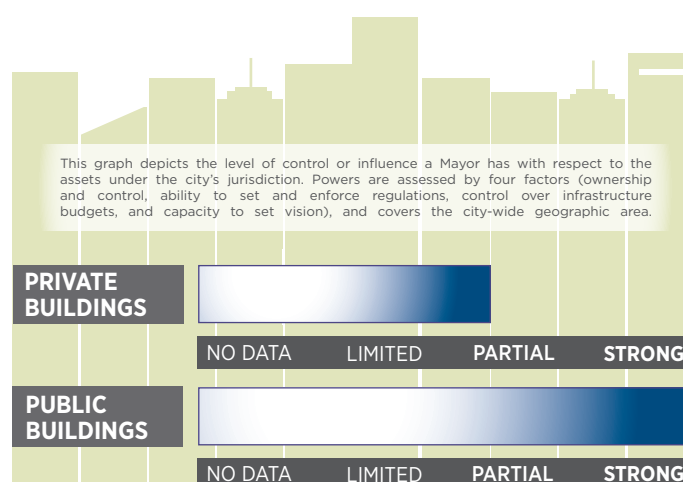
58
LEED Certified
Projects (Japan)

71
LEED Registered
Projects (Japan)



Graph depicts the distribution of LEED certified projects in Japan

MAYORAL POWERS



GREEN RESIDENTIAL

Over 5,000 homes throughout the city took part in the Yokohama Smart City Project. As part of the initiative, residential units were linked to the Home Energy Management System, which allowed for more energy efficient operation of individual residential units. Newly built homes in Yokohama are required to comply with energy efficiency standards laid out by the Comprehensive Assessment System for Built Environment Efficiency (CASBEE). In order to support this requirement, low-interest loans are available to owners or developers who want to construct a green home.⁷

SUSTAINABLE COMMUNITIES

In order to alleviate the effects of urban sprawl, transit railways were constructed and other modes of public transportation (such as subway, bus, and cycling) have been promoted. Bay Bike, the bike share system in Yokohama, is run by Docomo, Japan's largest private telecommunications company. Having a partner with vast managerial and operational experience allows the Government of Yokohama to focus on larger scale sustainability issues.⁸

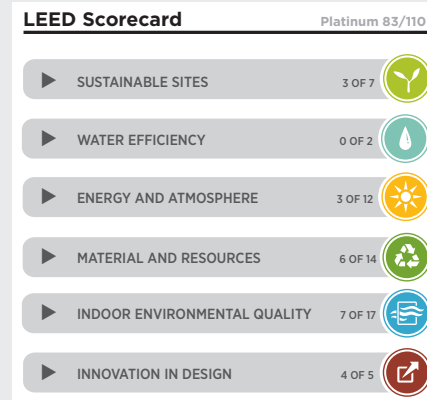
GREEN SCHOOLS

The Yokohama Eco School (YES) activities were created after the realization that individual citizens must be educated to take actions to reduce emissions. The activities, originally intended to raise awareness amongst school children, have grown into a framework that fosters conversation between companies, universities, and the government.⁹

PROJECT SPOTLIGHT:

Accenture Japan Minato Mirai Project

Accenture Japan's Minato Mirai Project achieved a Certified rating under the LEED for Commercial Interiors rating system in July 2009. Construction and demolition debris associated with the project was diverted from landfills at a rate of 50%. 30% of the furniture used in the space is salvaged, refurbished, or reused. The building materials used contained 10% recycled content.¹⁰



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SOUTHEAST ASIA AND OCEANA

- ▶ BANGKOK
- ▶ HANOI
- ▶ HO CHI MINH CITY
- ▶ JAKARTA
- ▶ MELBOURNE
- ▶ SINGAPORE
- ▶ SYDNEY

- ▶ NORTH AMERICA
- ▶ CENTRAL & SOUTH AMERICA
- ▶ EUROPE
- ▶ AFRICA
- ▶ SOUTH & WEST ASIA
- ▶ EAST ASIA
- ▶ SOUTHEAST ASIA & OCEANA

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GREEN BUILDING CITY MARKET BRIEF

BANGKOK

THAILAND



A NATIONAL MOVEMENT

Thailand's National Sustainable Development Strategy was instituted in 2008 with the goal of creating a greener, more livable society. The strategy is comprised of four complimentary objectives:

- Eliminate poverty through sustained and equitable economic growth.
- Enhance environmental security and sustainability.
- Create a knowledge-based and ethical society.¹

LEADING BY EXAMPLE

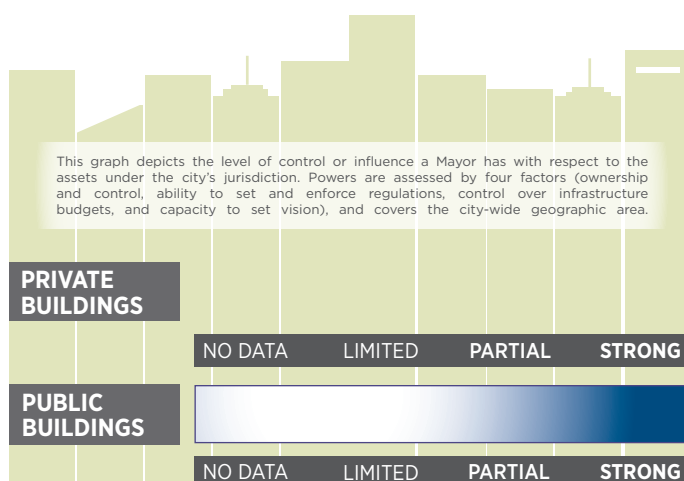
Thailand created the Energy Efficiency Development Plan in 2011 with the goal of reducing energy intensity by 25% by 2030, compared with 2011. Strategies aimed to help reach this target include:

- Developing baselines and energy data management
- Developing energy efficiency standards
- Supporting the uptake of building energy codes
- Devising incentive instruments
- Integrating plan into broader climate policy²

CITY EMISSIONS TARGET:

In 2007, the Bangkok Metropolitan Administration enacted the Action Plan on Global Warming Mitigation 2007-2012 with the goal of reducing emissions by 15% against business as usual levels by 2012.³

MAYORAL POWERS



CITY DETAILS

Population	8.3 million
Land Area (km ²)	1,568
Gross Domestic Product (in USD billions)	262.4
Average Walk Score ⁴	79/100
Annual Rainfall (mm/year)	1,648
Climate Action Plan	Yes (outdated)

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁵	42,750,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Thailand) ⁶	119
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PROJECT BREAKDOWN

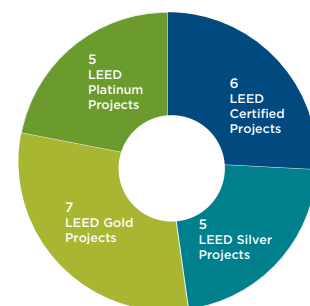


23
LEED Certified
Projects (Bangkok)

26
LEED Registered
Projects (Bangkok)

51
LEED Certified Projects
(Thailand)

79
LEED Registered
Projects (Thailand)



Graph depicts the distribution of LEED certified projects in Bangkok

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✗
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✗
Neighborhood-Scale Sustainability	✗

POLICY SPOTLIGHT:

Thailand's Energy Efficiency Revolving Fund was established in 2003 to provide a line of credit to local banks, to then provide low-interest loans to developers for energy efficiency and renewable energy projects. The fund is managed by the Department of Alternative Energy Development and Efficiency, and loan periods can be up to a maximum of 7 years. The maximum allowable interest rate is set at 4%. Eligible measures include:

- Reducing heat from sun glare
- Enhancing efficiency of air-conditioning
- Use of sustainable and durable building materials
- Efficient lighting retrofits
- Purchasing of energy efficient equipment
- Installation of building management systems
- Other energy conservation measures prescribed by Ministerial Regulation⁷

GREEN CODES

In 1995, Thailand developed the Energy Conservation Promotion Act, which has since been updated twice, once in 2000, and again in 2005. The act applied mandatory energy efficiency and conservation measures to large commercial and industrial facilities, and created voluntary initiatives from small and medium sized enterprises. It requires buildings larger than 2,000 square meters or those with a peak energy demand above 1,000 megawatts meet standards for six green criteria:

- Building envelope (overall thermal transfer value/roof thermal transfer value)
- Lighting
- Heating
- Air conditioning
- Renewable energy
- Overall performance⁸

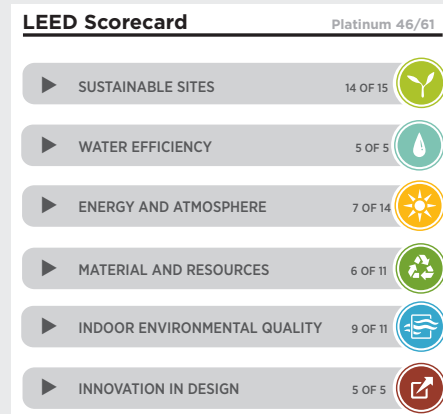
PRIVATE SECTOR INCENTIVES

Commercial institutions that have modified or replaced machinery for the purpose of saving energy are eligible to receive a corporate income tax waiver at a rate equal to half of the investment costs for a period of three years. Businesses specializing in energy efficiency and renewable energy are exempt from import duties for a period of up to eight years.⁹

PROJECT SPOTLIGHT:

Energy Complex

Bangkok's Energy Complex achieved Platinum certification under the LEED Core and Shell rating system in July 2010. The building's design resulted in a 50% reduction in wastewater generation and a 14% improvement on a modeled baseline for building energy performance. The building generates 1% of its power demand through renewable sources on-site.¹⁰



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GREEN BUILDING CITY MARKET BRIEF

HANOI

VIETNAM



HOUSING DEMAND

The Vietnam Statistical Office recognizes that for every 120,000 people migrating to the capital every year, 2.4 million square meters of housing must be added. Over the past 10 years, Hanoi has developed more than 25 million square meters of residential building stock, including 10.7 million square meters of affordable housing, and 14.3 million square meters of multifamily houses.

The Vietnam Government approved a savings fund for public housing development that aims to increase the options low-income residents have when it comes to renting, buying, and renovating housing. With a vision to 2015, it is expected to impact 300 low-income housing projects nationwide.¹

GREEN BUILDING RATING SYSTEM

VGBC's LOTUS rating system with LOTUS non-residential, LOTUS residential, and the newly launched LOTUS BIO (Buildings in Operations) is the proprietary green building rating system for the country. Within the LOTUS rating system, buildings can achieve a Certified, Silver, or Gold rating. LOTUS rates buildings at the design, as-built, and operational stages measuring environmental effects, energy efficiency, and impact on occupants. The system examines 9 key categories of sustainable building design including: energy, water, materials, and waste. The LOTUS Green Building Rating Tool aims to establish standards and benchmarks to guide the local construction industry towards a more efficient use of resources as well as introduce and promote environmentally friendly practices.²

BETTER CODES AND STANDARDS

In February 2008, Vietnam approved the National Target Program for the Response to Climate Change in P.M. Decision No. 158/2008/QĐ-TTg. The Vietnam National Green Growth Strategy 2011-2020 proposes requirements about construction, green building development, green urban areas, and eco-cities. To fulfill the target, Vietnam needs to carry out strategic objectives to reduce greenhouse emissions by 8-10% between 2011-2020. When achieved, energy consumption on GDP would decrease from between 1-1.5% annually and greenhouse gas emissions for energy activities would be cut by between 10-20%. The National Action Plan on Green Growth aims to reduce greenhouse gas emissions and increase the use of clean and renewable energy was then announced on April 18, 2014.

CITY EMISSIONS TARGET:

No emissions target is currently available for Hanoi.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✗
New/Existing Commercial Building Incentives	✗
New/Existing Residential Building Incentives	✗
Green Schools	✗
Neighborhood-Scale Sustainability	✗

CITY DETAILS

Population	7.1 million
Land Area (km ²)	3,344
Gross Domestic Product (in USD billions)	42
Average Walk Score ³	88/100
Annual Rainfall (mm/year)	1,676
Climate Action Plan	No

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e)	--
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

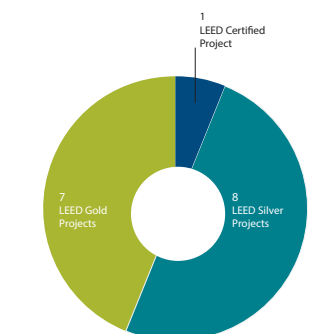
MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Vietnam) ⁴	20
--	----

PROJECT BREAKDOWN

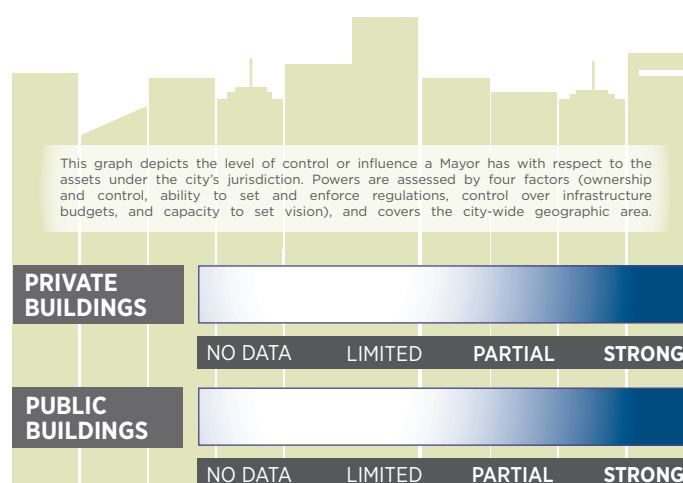


- 0 LEED Certified Projects (Hanoi)
- 6 LEED Registered Projects (Hanoi)
- 16 LEED Certified Projects (Vietnam)
- 24 LEED Registered Projects (Vietnam)



Graph depicts the distribution of LEED certified projects in Vietnam

MAYORAL POWERS



The Government of Vietnam and the International Finance Corporation cooperated in the revision of the current Energy Efficiency Building Code. It was first issued in 2005, then replaced by the newest version, QCVN 09:2013/BXD on September 26th, 2013. The newest version was accompanied with the circular 15/2013/TT-BXD, which took effect on November 15th, 2013.⁵

The Vietnam National Energy Efficiency Program (VNEEP) is a set of activities that complement the mandatory codes to encourage and promote energy efficiency measures.

- Phase 1 (2006-2010): Establish models for energy management across government, industry, equipment and appliances, buildings, and transport sectors; reduce 3-5% of total energy consumption compared to business-as-usual levels.
- Phase 2 (2011-2015): Reduce energy consumption by 5-8% compared to BAU levels; the National Steering Committee, established in 2006, will oversee the implementation of VNEEP throughout both phases.⁶

GREEN URBAN AREAS

Hanoi is building up more green urban areas in order to facilitate greener space and tighter community connection. The Ecopark is currently the largest eco-urban-township development in Northern Vietnam with a total development area of 500 hectares, with over 110 hectares of green areas and lakes.⁷

SUSTAINABLE URBAN DEVELOPMENT

In addition to legal documents officially issued to encourage green growth and sustainable construction, on 8th May 2014, Ministry of Industry and Trade proposed a detailed plan to implement the national action plan on sustainable development between 2013 and 2015.⁸

PROJECT SPOTLIGHT:

Green One UN House

Green One UN House in Hanoi achieved provisional Gold certification under the LOTUS Non-Residential Pilot – Major Renovation rating system in September 2012. The project is located in a retrofitted apartment building. Sustainable features include: green roofs, drought tolerant landscaping, water efficient fixtures, energy efficient lighting and air conditioning, use of low VOC materials, and photovoltaic solar panels to contribute to the building's energy demand.⁹

Scorecard

- Energy - 27/34
- Water - 6/15
- Material - 14/20
- Ecology - 10/13
- Waste & Pollution - 10/13
- Health & Comfort - 13/20
- Adaptation & Mitigation 10/13
- Community - 4/10
- Management - 12/12
- Innovation - 5

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GREEN BUILDING CITY MARKET BRIEF

HO CHI MINH CITY

VIETNAM



A CITY-WIDE MOVEMENT

For the past decade, Ho Chi Minh City has been a leader in the green building movement through its various policies to promote energy-efficient and environmentally sound practices.

LEADING BY EXAMPLE

The Vietnam Green Building Council's (VGBC) online Green Database provides consumers and stakeholders alike the opportunity to examine and explore different elements of green building. VGBC's LOTUS rating system with LOTUS Non-Residential, LOTUS Residential, and the newly launched LOTUS BIO (Buildings in Operation) is the proprietary green building rating system for the country. Within the LOTUS rating system, buildings can achieve a Certified, Silver, or Gold rating. LOTUS rates buildings at the design, as-built, and operational stages measuring environmental effects, energy efficiency, and impact on occupants. The system examines 9 key categories of sustainable building design, targeting resource conservation, healthy indoor environment for occupants, and minimal impacts on the environment. The LOTUS Green Building Rating Tool aims to establish standards and benchmarks to guide the local construction industry towards more efficient use of resources, as well as introduce and promote environmentally friendly practices.¹

GREEN CODES

The Government of Vietnam and the International Finance Corporation cooperated in the revision of the current Energy Efficiency Building Code. It was first issued in 2005, then replaced by the newest version, QCVN 09:2013/BXD, on September 26th, 2013. The newest version was accompanied with the circular 15/2013/TT-BXD, which took effect on November 15th, 2013.²

CITY EMISSIONS TARGET:

No emissions target is currently available for Ho Chi Minh City.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✗
New/Existing Commercial Building Incentives	✗
New/Existing Residential Building Incentives	✗
Green Schools	✗
Neighborhood-Scale Sustainability	✗

CITY DETAILS

Population	8.2 million
Land Area (km ²)	2,297
Gross Domestic Product (in USD billions)	49
Average Walk Score ³	74/100
Annual Rainfall (mm/year)	1,931
Climate Action Plan	No

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁴	11,722,632
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Vietnam) ⁵	20
--	----

PROJECT BREAKDOWN

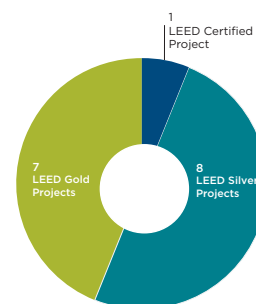


2
LEED Certified Projects
(Ho Chi Minh City)

11
LEED Registered Projects
(Ho Chi Minh City)

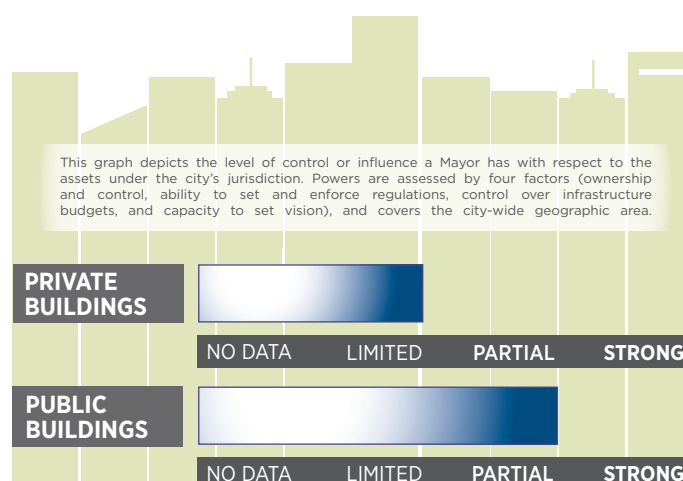
16
LEED Certified Projects
(Vietnam)

24
LEED Registered
Projects (Vietnam)



Graph depicts the distribution of LEED certified projects in Vietnam

MAYORAL POWERS



POLICY SPOTLIGHT:

Ho Chi Minh City's Climate Adaptation Strategy consists of six strategies to make the city a unique delta city by strengthening the blue-green network and increasing urban ventilation. The strategy recognizes the need to maintain natural ventilation, promote natural air flow, and limit flood damage for high-rise commercial and residential buildings, which are the most rapidly increasing building sectors in the city. Ultimately, the strategy aims to reduce over 1 million tons of Co2 emission each year.⁶

The Vietnam National Energy Efficiency Program (VNEEP) is a set of activities that compliment the mandatory codes to encourage and promote energy efficiency measures.

- Phase 1 (2006-2010): Establish models for energy management across government, industry, equipment and appliances, buildings, and transport sectors; reduce 3-5% of total energy consumption compared to BAU levels.
- Phase 2 (2011-2015): Reduce energy consumption by 5-8% compared to BAU levels; the National Steering Committee, established in 2006, will oversee the implementation of VNEEP throughout both phases.

In February 2008, Vietnam approved the National Target Program for the Response to Climate Change in P.M. Decision No. 158/2008/QĐ-TTg. The Vietnam National Green Growth Strategy 2011-2020 proposes requirements about construction, green building development, green urban areas, and eco-cities. To fulfill the target, Vietnam needs to carry out strategic objectives to reduce greenhouse emissions by 8-10% for the 2011-2020 period. When achieved, energy consumption on GDP would decrease from between 1-1.5% annually and greenhouse gas emissions for energy activities would be cut by between 10-20%. The National Action Plan on Green Growth, aims to reduce greenhouse gas emissions and increase the use of clean and renewable energy was announced on April 18th, 2014.⁷

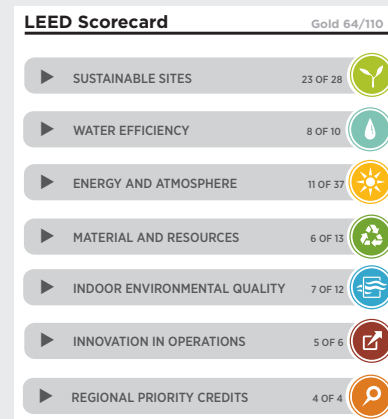
SUSTAINABLE COMMUNITIES

In addition to legal documents officially issued to encourage green growth and sustainable construction, on May 8, 2014, Vietnam's Ministry of Industry and Trade proposed a detailed plan to implement the national action plan on sustainable development between 2013 and 2015.⁸

PROJECT SPOTLIGHT:

President Place

Ho Chi Minh City's President Place achieved Gold certification under the LEED Core and Shell rating system in December 2012. The building's design resulted in a 40% reduction in indoor water use and a 100% reduction in potable water used in landscaping, both against a modeled baseline. 20% of materials used in construction were extracted, harvested, recovered, or manufactured within 500 miles of the building site. Construction and demolition debris associated with the project was diverted from landfills at a rate of 75%.⁹



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GREEN BUILDING CITY MARKET BRIEF

JAKARTA

INDONESIA



A CITY-WIDE MOVEMENT

Jakarta's green building initiatives have drawn the attention of the international community thanks to their audacity and ambition. The city's brand-new Green Building Code, which sets 7 key points as the standard for buildings exceeding certain floor areas, is an unparalleled set of government requirements that will transform the construction landscape with the potential to reduce Co2 emissions from buildings by approximately 140 million tons annually.¹

LEADING BY EXAMPLE

Complementing the bold Green Building Code is an array of policies, partnerships, and initiatives which aim to transform the local green building landscape. Vision 25/25 includes plans to increase the use of renewable energy to 25% by 2025 from the current 4%. Green Building Council Indonesia has just launched GREENSHIP, the country's first green building certification system; and in April 2013, the Jakarta Building Supervision and Regulatory Agency (JBSRA) made green building standards mandatory for all new high-rise buildings.²

AFFORDABLE HOUSING

Nationwide, the household sector consumes about 11% of total energy. Green building regulations seek to reduce energy use in homes by 20% with only marginal increases in construction costs. A recent sensitivity analysis found that an energy savings of more than 30-40% can be achieved by simple measures, and Jakarta seeks to take advantage of these efficiencies.

GREEN SCHOOLS

The Home and School Energy Champion 2012 competition challenged students across the country to make behavioral changes to energy consumption. It promoted the use of metrics through monthly energy intensity updates from the participants.³

CITY EMISSIONS TARGET:

Jakarta aims to reduce emissions by 30% by 2030 compared with projected business-as-usual levels from 2005.

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✗
New/Existing Commercial Building Incentives	✗
New/Existing Residential Building Incentives	✗
Green Schools	✓
Neighborhood-Scale Sustainability	✗

CITY DETAILS

Population	9.2 million
Land Area (km ²)	662
Gross Domestic Product (in USD billions)	70.2
Average Walk Score ⁴	89/100
Annual Rainfall (mm/year)	2,095
Climate Action Plan	No

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁵	436,860,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

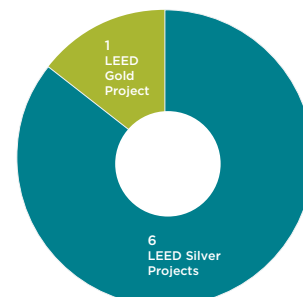
MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Indonesia) ⁶	16
--	----

PROJECT BREAKDOWN

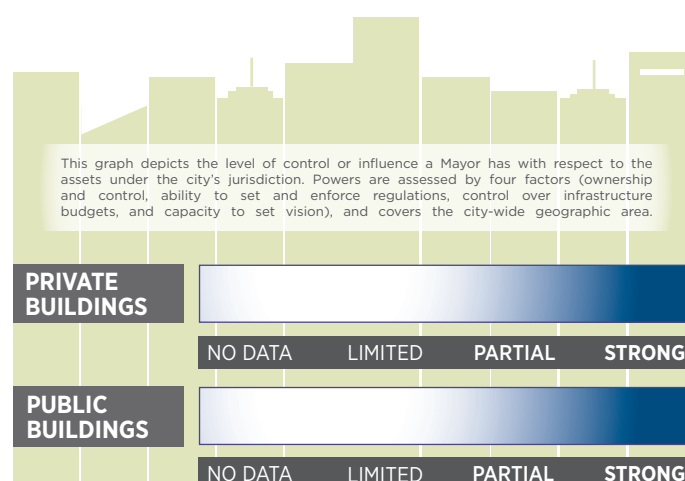


- 2 LEED Certified Projects (Jakarta)
- 11 LEED Registered Projects (Jakarta)
- 7 LEED Certified Projects (Indonesia)
- 24 LEED Registered Projects (Indonesia)



Graph depicts the distribution of LEED certified projects in Indonesia

MAYORAL POWERS



POLICY SPOTLIGHT:

Jakarta Regulations:

- The Jakarta Green Building Code requires emissions reductions through various measures across a plethora of building sizes, and is mandated in all government-owned structures
- Government Regulation No. 70/2009 on Energy Conservation requires buildings whose annual energy consumption is equal to or greater than 6,000 tons of oil equivalent (TOE) to adhere to defined standards and implement appointed procedures

BUILDING MONITORING

Nationally, the Energy Efficient Buildings Program works with the Indonesian National Standard (SNI) for Energy Efficient Buildings to develop an environmentally-responsible building code across the following four key areas: building envelope, air ventilation, lighting, and audit procedures.

Furthermore, the Ministry of Mineral Resources is establishing an award for Energy Saving and Energy efficiency for buildings that have applied energy saving schemes. This award started in 2012; the winner automatically becomes a nominee for the Association of South-East Asian Nations Energy Award.⁷

GREEN CODES

The prominent city code for Jakarta is the brand-new Green Building Code, which sets 7 key points as the standard for buildings exceeding 10,000 square meters (for educational facilities), 20,000 square meters (for hotels and hospital), and 50,000 square meters (for offices, malls, and apartments). The code covers standards such as lighting systems, ventilation and air quality, and water efficiency (the city receives more than 2,090 mm of rain each year). In the city's goal to become a world leader on climate change, Jakarta's Green Building Code has a potential carbon reduction of 3 million metric tons per year by 2020.

RETROFITS

The Partnership Program on Energy Conservation is a government-funded energy audit program available to industries and commercial buildings who display an interest in retrofitting existing structures. Furthermore, Government Regulation No. 70/2009 on Energy Conservation requires buildings whose annual energy consumption is equal to or greater than 6,000 TOE to appoint energy managers, develop energy conservation programs, implement recommendations from energy audits, and report the implementation of energy measures each year.

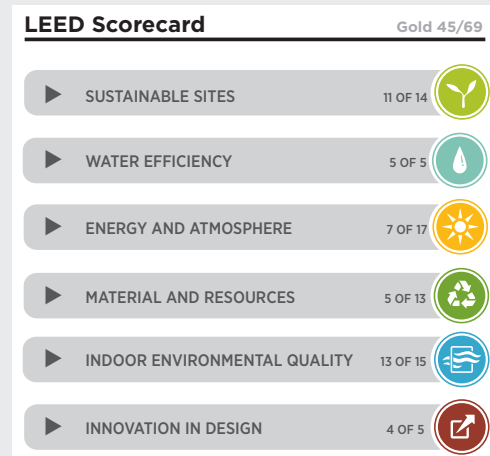
SUSTAINABLE COMMUNITIES

Through its many initiatives, Jakarta maintains plans to reduce current energy demands by 33.85% compared to business-as-usual levels by 2025.

PROJECT SPOTLIGHT:

Ching-Luh NIKE Factory Office Building

The Nike Factory office building in Jakarta achieved Gold certification under the LEED for New Construction rating system in January 2011. The building's design resulted in a 50% reduction in potable landscape water use and a 20% reduction in indoor water use, both against a modeled baseline. The structure achieved a 28% improvement on a modeled baseline for building energy performance.⁸



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GREEN BUILDING CITY MARKET BRIEF

MELBOURNE

AUSTRALIA



A CITY-WIDE MOVEMENT

Melbourne's aspirations to be an Eco-City, are underpinned by community strategies to achieve zero-net emissions, resource efficiency and recovery, and to build climate resilience.

The city received a City Climate Leadership Award for its Climate Adaptation Program. The program was developed in response to the impacts of more than a decade of drought, low rainfalls, and record-breaking extreme heat - which had a major impact on the city's trees and green spaces. Melbourne has invested more than \$40 million (AUD) for the implementation of ecosystem driven solutions to reduce susceptibility to drought and to cool the city by 4°C. Melbourne aims to double its tree canopy cover from 20% to 40%. 12,000 trees have been planted in the past four years. Stormwater harvesting capacity has been increased in order to irrigate green spaces with recycled water. 2014 was the second consecutive year Melbourne has earned a C40 Siemens City Climate Leadership Award. The Melbourne Sustainable Buildings Program received an award in the Energy Efficient Built Environment category last year.¹

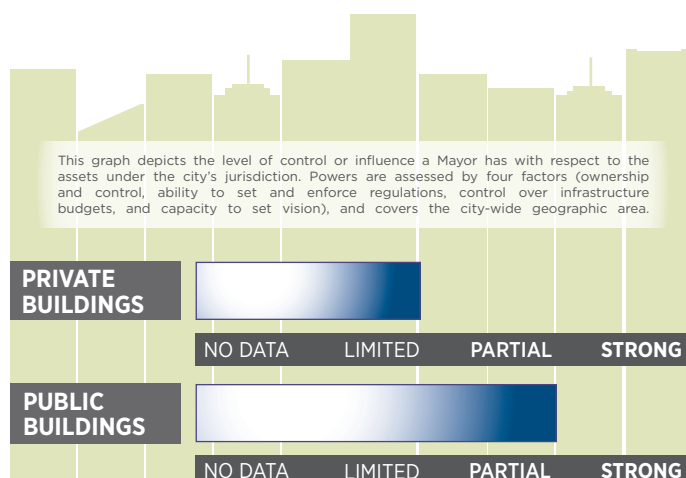
PRIVATE SECTOR INCENTIVES

The Victorian Provincial Government's Energy Saver Incentive Program offers rebates to Victorian businesses for the installation of selected energy saving products and services related to lighting upgrades. The incentive level is determined by lifetime carbon emissions reductions resulting from the action taken. The program stipulates that each ton of lifetime carbon emissions reduced through energy efficiency improvements is equal to one Victorian Energy Efficiency Certificate (VEEC). VEECs are valued on market-based principles and the price fluctuates according to supply and demand. Historically, certificate prices have fluctuated between \$7 and \$45 (AUD). Under the program, only accredited professionals are able to issue VEECs.²

CITY EMISSIONS TARGET:

Melbourne aims to achieve a 100% reduction in emissions by 2020, compared with 2006 emission levels.

MAYORAL POWERS



CITY DETAILS

Population	100,000
Land Area (km ²)	38
Gross Domestic Product (in USD billions)	222
Average Walk Score ³	86/100
Annual Rainfall (mm/year)	650
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁴	4,155,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	18,414

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Australia) ⁵	117
--	-----

PROJECT BREAKDOWN



4
LEED Certified
Projects (Melbourne)

4
LEED Registered
Projects (Melbourne)

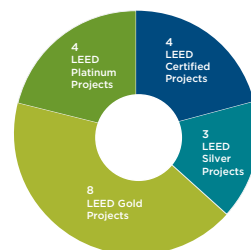
19
LEED Certified
Projects (Australia)

25
LEED Registered
Projects (Australia)

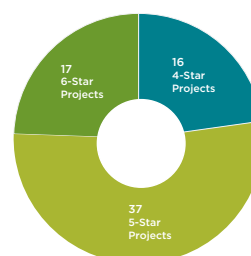
70
Green Star Certified
Projects (Melbourne)

818
Green Star Certified
Projects (Australia)

359
Green Star Registered
Projects (Australia)



Graph depicts the distribution of LEED certified projects in Australia



Graph depicts the distribution of Green Star certified projects in Australia

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

POLICY SPOTLIGHT:

Zero-Net Emissions by 2020: A Road Map to a Climate-Neutral City

This innovative policy addresses sustainability through comprehensive incentives and regulations which:

- Identify key sectors for carbon emissions reduction: commercial, residential, passenger transport, and the de-carbonization of the energy supply.
- Require that all new municipal building projects achieve a 5 Star Green Star rating and implement the Green Star – Performance rating tool on a range of facilities.
- Increase the average National Australian Built Environment Rating System (NABERS) rating of commercial buildings in the city of Melbourne to 4 stars by 2018 (which roughly equates to an average increase in energy efficiency of 40% per building).
- Provide incentives to retrofit, and sanctions to encourage improvements in energy efficiency.

Total emissions are expected to grow 3,981 kt CO₂-e, or by 23%, by 2020 if no action is taken. To combat increasing emissions, the city of Melbourne developed the Zero Net Emissions by 2020 plan – A road map to a Climate Neutral City.

The 2008 update identifies four key sectors to reduce carbon emissions: commercial, residential, passenger transport, and energy supply, including the following sectorial goals:

1. *Commercial sector:* 25% fewer emissions by 2020 compared to business-as-usual levels and increase the average NABERS, or equivalent, rating of commercial buildings to 4 by 2018.
2. *Residential:* 20% fewer emissions by 2020.
3. *Passenger transport (road and rail):* 20% fewer emissions from public transport by 2020, 15% fewer emissions from cars, and a 100% increase in bicycle use.
4. *Greening the power supply:* 18% fewer emissions from traditional energy sources by 2020, and generating 25% of electricity from renewable sources by 2018.

LEADING BY EXAMPLE

In 2002, the city of Melbourne adopted an ambitious target to become a carbon-neutral city by 2020.

The city of Melbourne successfully met the interim target of a 50% reduction below 1996-1997 emission levels in 2010. In 2012, the city was certified as a carbon-neutral organization under the Commonwealth Government's National Carbon Offset Standard. The Zero-Net Emissions by 2020 plan was updated in 2014 to build upon the original strategy. Specific objectives include:

- Maintaining carbon neutrality
- Deriving 25% of electricity from renewable sources by 2018
- Increasing the percentage of all trips using low emissions transport from 51% to 2009 to 60% in 2018
- Decreasing waste to landfill per resident by 5% by 2018⁶

GREEN CODES AND RETROFITS

For all existing structures, the following approaches will be used to reduce building sector emissions:

1. Incentives to retrofit: matching of energy performance contractors with building owners (as part of the 1200 Buildings program)
2. Promotion: facilitating the specialization and growth of Melbourne's business owners
3. Regulations: utilize the range of regulatory options available to encourage building owners to improve energy performance

PROJECT SPOTLIGHT:

ANZ Centre

Melbourne's ANZ Centre achieved 6 Star Green Star – Office Interiors v1.1 certification in July 2012. It is the largest single-tenanted 6 Star Green Star-rated office fit-out in Australia. The 83,796 square meter office is only the second building to have achieved the 6 Star Green Star certification 'trifecta' of Design, As Built, and Interiors ratings.

The ANZ Centre reduces its peak load energy demand with a tenancy tri-generation system to provide direct supply to tenants. Energy modelling has found that peak electricity demand for the building has been reduced by 20% as a result of the tri-generated supply system.

Water from taps, toilets, and showers throughout the building is reticulated to the centre's onsite blackwater treatment plant, delivering a 20% improvement in water efficiency when compared to average buildings; saving thousands of liters of potable water annually and generating significant cost savings.

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GREEN BUILDING CITY MARKET BRIEF

SINGAPORE

SINGAPORE



LEADING BY EXAMPLE

Building design and construction in Singapore is guided by the city-state's Green Building Masterplan, which addresses environmental sustainability and includes policy incentives to stimulate the growth of green buildings. With the support of a strong construction industry, Singapore's green building movement is further advanced by various collaborations and efforts by both the public and private sector.

The Singapore Building and Construction Authority's (BCA) Green Mark Scheme was launched in 2005 to promote sustainability in the built environment. The Singapore Green Building Council (SGBC) complements BCA's efforts through green building products and services certification schemes, which were launched in 2010 and 2012, respectively.

GREEN RESIDENTIAL BUILDINGS

The incentive scheme was established in October 2012 to encourage residents to identify technical solutions to achieve higher sustainability thresholds. The incentive provides up to S\$100,000 per application, supporting the testing of green solutions and implementations within the precinct.

GREEN CODES

Singapore has established a goal to achieve the national target to green at least 80% of the buildings in Singapore by 2030. The BCA Green Building Masterplan and its initiatives are regularly reviewed and recalibrated in order to meet this ambitious target. In 2008, the Building Control Act was amended, requiring all new construction and retrofits of existing buildings to achieve, at minimum, a Certified rating under the Green Mark Scheme.

Singapore aims to train some 20,000 green specialists by 2020 to boost the green workforce.

CITY EMISSIONS TARGET:

In 2009, Singapore pledged to reduce its emissions by 7-11% below business-as-usual levels by 2020. This figure will increase to 16% in the event of a legally binding global agreement.

PROJECT TYPE AND PRESENCE

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✓
Green Municipal Buildings	✓
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✓
Neighborhood-Scale Sustainability	✓

CITY DETAILS

Population	5.3 Million
Land Area (km ²)	716
Gross Domestic Product (in USD billions)	222.7
Average Walk Score	92/100
Annual Rainfall (mm/year)	2342.5
Climate Action Plan	Yes

BUILDING PERFORMANCE

EMISSIONS

City-wide Emissions (metric tonnes CO ₂ e) ¹	4,510,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tonnes CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

Certified Green Mark Facilities Managers	95
Certified Green Mark Managers	564
Certified Green Mark Professionals	58
LEED Credentialed Professionals ²	217

PROJECT BREAKDOWN

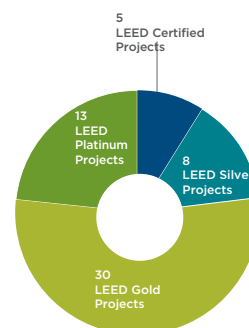


921
Green Mark Certified
Buildings (Singapore)



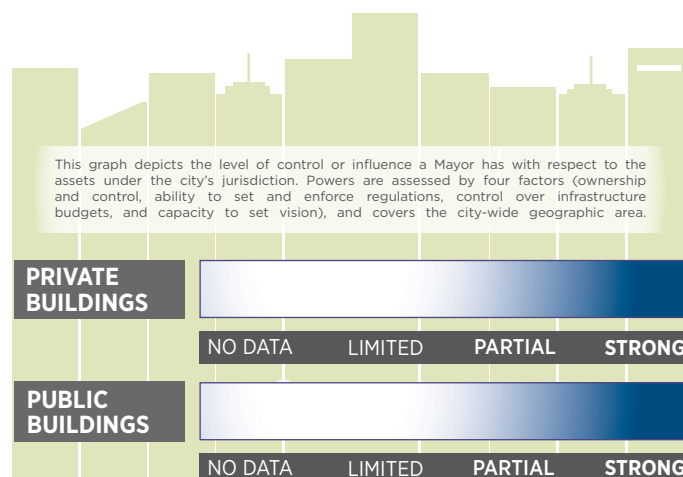
56
LEED Certified Projects
(Singapore)

39
LEED Registered Projects
(Singapore)



Graph depicts the distribution of LEED certified projects in Singapore

MAYORAL POWERS



POLICY SPOTLIGHT:

GREEN MARK CERTIFICATION POLICIES

- In 2008, legislation was passed requiring all buildings, 2,000 square meters or larger to achieve, at a minimum, Green Mark Certification.
- Public sector buildings with air-conditioned floor areas 5000 square meters or more are required to achieve Green Mark Platinum certification.
- Existing public sector buildings with an air-conditioned area greater than 10,000 square meters are required to achieve Green Mark Gold^{Plus} certification by 2020 through renovations and retrofits.

GREEN SCHOOLS

The inclusion of youth in sustainability efforts is paramount to achieving future environmental goals. The SGBC's Green Schools Initiative and the BCA's Greenovate Challenge were introduced to educate students and teachers on the role that buildings play in environmental sustainability, as well as the impact that building design and technology have on student health and productivity.

RETROFITS

The Green Mark Incentive Scheme for Existing Buildings provides S\$100million for owners to undertake retrofits and renovations to improve energy, water and resource efficiency. The scheme provides cash incentives for upgrades and retrofits and co-funds up to 50% (capped at S\$3 million) of the costs of energy efficient equipment. Additionally, under the Building Retrofit Energy Efficiency Financing (BREEF) Scheme, the government shares 50% of the risk of any loan default with the participating financial institution and provides credit facilities for the purchase and installation of energy efficient equipment.

NEIGHBORHOOD-SCALE SUSTAINABILITY

In 2012, the Housing and Development Board (HDB)'s "Greenprint Precinct Plan" was announced. The Greenprint Precinct Plan established a Greenprint community test-bedding fund to encourage the co-creation of innovative green solutions in a pilot neighborhood, covering 38 blocks and comprising 3,194 units. Greenprint introduced energy and water-saving solutions through installation of solar panels, sensor-controlled LED lightings for outdoor street lamps and rainwater saving systems. The preparation for the Greenprint Precinct Plan started in January 2013 and the pilot neighborhood was displayed to collect feedback from local residents.

In addition, HDB is working with the Town Council to introduce the "Save-As-You-Reduce" scheme, which will encourage reduction in waste per household, as well as recycling. Wherein, each household will save a dollar on the monthly waste collection fee if they reduce their waste by 20%.

PROJECT SPOTLIGHT:

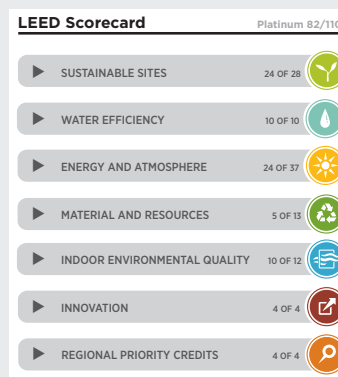
Zero Energy Building

The Zero Energy Building (ZEB), as part of the Building and Construction Authority's BCA Academy, is the first zero energy building in Singapore to be retrofitted from an existing building. This retrofitting eliminated the aspect of waste usually incurred by demolishing a building and reconstructing a zero-energy building on the same site. Thanks to the ZEB, there is now a precedent set for retrofitting existing buildings to zero-energy buildings, which will help Singapore meet the Inter-Ministerial Committee on Sustainable Development's (IMCSD) target for 80% Green Mark Certification by 2030 for all buildings. The ZEB also uses passive design measures and solar energy to save the building S\$84,000 a year compared to a typical Singapore office building.³

PROJECT SPOTLIGHT:

Asia Square Tower 1

The Asia Square Tower 1, located in the heart of the city-state, is Platinum certified to both the Green Mark and LEED for Core and Shell Rating Systems. The building features Singapore's first on-site biodiesel plant to convert waste cooking oil to bio-diesel. Zero potable water is used for irrigation, which, in addition to rigorous water efficiency measures, resulted in a 40% reduction in baseline water use with a 50% reduction in wastewater generation.



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GREEN BUILDING CITY MARKET BRIEF

SYDNEY

AUSTRALIA



A CITY-WIDE MOVEMENT

The city of Sydney launched the Better Buildings Partnership in 2011, a collaborative partnership with the city's leading commercial building owners. The program aims to improve the sustainability of Sydney's commercial and public building sectors, and has engaged building owners responsible for 54% of Sydney's commercial office space. Through the partnership, building owners have committed to reduce their collective environmental footprint by 70%, from a 2006 baseline, by 2030. Data from participating spaces is gathered and analyzed to determine progress. Measured observations include reductions in greenhouse gas emissions, potable water consumption and waste generation.¹

LEADING BY EXAMPLE

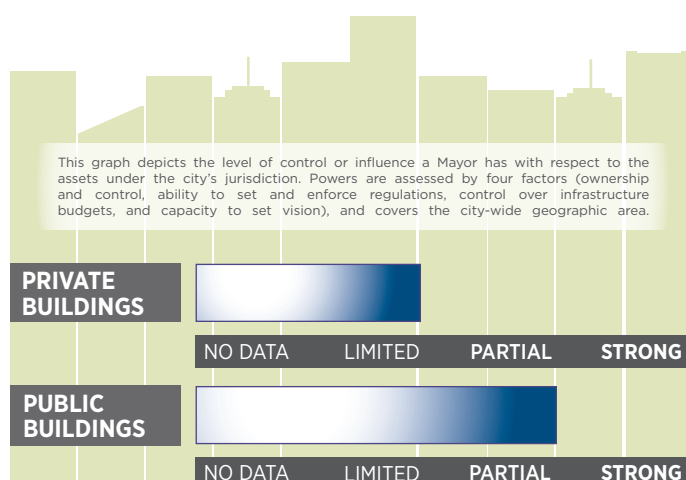
The Sydney government spent more than \$35 million (USD) retrofitting its town hall to protect it for future generations and improve its energy efficiency. Building lights were upgraded to newer, more efficient alternatives and outfitted with occupancy sensors, reducing energy consumption by 30%. New hydraulics and stormwater infrastructure was added throughout the building, helping reduce water consumption by between 15% and 20%. In addition, 240 solar photovoltaic panels capable of supplying 48 kilowatts of energy were installed on the building's roof. Insulation was upgraded to retain heat in the winter and keep the building cool in the summer.²

In 2011, the city of Sydney was the first local council in Australia to be certified as carbon neutral under the National Carbon Offset Standard.

CITY EMISSIONS TARGET:

Sydney aims to achieve a 70% emissions reduction by 2030, compared with 2006 levels.

MAYORAL POWERS



CITY DETAILS

Population	180,000
Land Area (km ²)	26
Gross Domestic Product (in USD billions)	213
Average Walk Score ³	98/100
Annual Rainfall (mm/year)	989
Climate Action Plan	Yes

BUILDING PERFORMANCE EMISSIONS

City-wide Emissions (metric tons CO ₂ e) ⁴	5,500,000
% of Emissions from the Building Sector	--
Municipal Emissions (metric tons CO ₂ e)	--

MEMBERSHIP AND PROFESSIONALS

LEED Credentialed Professionals (Australia) ⁵	117
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PROJECT BREAKDOWN



6
LEED Certified
Projects (Sydney)

10
LEED Registered
Projects (Sydney)

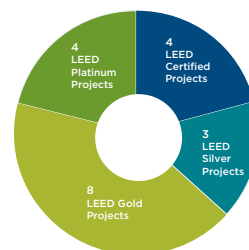
19
LEED Certified
Projects (Australia)

25
LEED Registered
Projects (Australia)

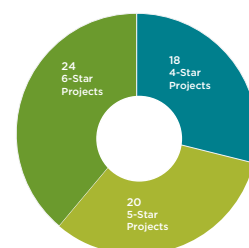
62
Green Star Certified
Projects (Sydney)

818
Green Star Certified
Projects (Australia)

359
Green Star Registered
Projects (Australia)



Graph depicts the distribution of LEED certified projects in Australia



Graph depicts the distribution of Green Star certified projects in Sydney

CITY-LEVEL POLICIES PRESENT

Green Building Codes	✓
Energy Benchmarking and Data Transparency	✗
Green Municipal Buildings	✗
New/Existing Commercial Building Incentives	✓
New/Existing Residential Building Incentives	✓
Green Schools	✗
Neighborhood-Scale Sustainability	✗

POLICY SPOTLIGHT:

Sustainable Sydney 2030 is the city's sustainable action plan, which is aimed to make Sydney a more green, global, and connected city. The plan consists of goals meant to help the city reach its carbon emissions reduction target of 70% by 2030. Key components include decentralized energy and water plans, along with a waste treatment master plan, and a climate change adaptation plan.⁶

GREEN CODES

The City Local Environmental Plan 2012 provides stipulations for design excellence that apply to buildings located in particular zoning districts. Under the plan, any building demonstrating design excellence may have a building height that exceeds the maximum height allowable in that area on the Height of Buildings Map by up to 10%. Buildings demonstrating design excellence are also eligible to be granted up to 10% additional floor area space. Criterion for design excellence includes:

- Environmental Impacts
- Sustainable design
- Overshadowing and solar access
- Proper fenestration
- Permeability of any pedestrian network
- Excellence in landscape design⁷

PRIVATE SECTOR INCENTIVES

The New South Wales Environmental Upgrade Agreement program provides funds to property owners seeking to improve property sustainability. The government recoups the money advanced to property owners by instituting a quarterly charge on their land. Eligible upgrade measures include:

- Increasing energy and/or water efficiency
- Preventing or reducing pollution and waste
- Reducing material consumption
- Reducing use of private motor vehicles
- Reducing greenhouse gas emissions⁸

SUSTAINABLE COMMUNITIES

The city of Sydney manages the Green Villages program, which is designed to help local residents lead more sustainable lifestyles. The program features green workshops, funding (including matching volunteer time with cash for materials or equipment), and the development of community gardens and the first city farm.

Sydney is in the process of creating a decentralized water system that is to include a local recycled water system alongside the current water network. The water will be treated and distributed using a separate pipe to be used for non-drinking purposes, such as watering the city's green areas and flushing toilets. The city also plans to introduce rain gardens in parks and on streets in an effort to reduce pollution entering the water system.⁹

The Barangaroo South project, part of the \$6 billion Barangaroo urban regeneration development on Sydney Harbor, aims to be Australia's first large-scale carbon-neutral community. Ultra energy-efficient buildings and precinct infrastructure, on and offsite low carbon and renewable energy, combined with zero carbon waste treatment and commuter carbon emission offsets will result in a net-carbon-neutral outcome in operations for the precinct. Commercial towers are being designed to achieve 6 Star Green Star Design and As Built ratings and residential developments are designed to achieve 5 Star Green Star ratings. With a mix of uses, including commercial, residential, retail and dining, along with a new landmark hotel, upon completion Barangaroo South will be home to around 1,200 residents, 23,000 office workers, and more than 2.9 hectares of public space.

PROJECT SPOTLIGHT:

One Bligh Street

One Bligh Street achieved 6 Star Green Star – Office Design & As Built v3 ratings. The project had previously earned a 6 Star rating under the Green Star Office Design v2 rating system prior to construction. The development's double skin, naturally-ventilated glass façade was designed to optimize occupant comfort. Views are maintained, with 70% of the Net Leasable Area (NLA) within eight meters of either the façade or the atrium, providing optimal daylight entry and solar control. 1 Bligh Street was the first building to use blackwater recycling in a high-rise office building in Sydney. Waste water is treated via a central blackwater treatment plant and recycled for toilet flushing and make-up water to the cooling towers. The design incorporates an innovative hybrid tri-generation arrangement that uses gas and solar energy to generate cooling, heating, and electricity. An array of 500 square meters of roof-mounted solar photovoltaic panels provide cooling for the building, in combination with the large tri-generation unit, the project reduces the load on the power grid by more than 27%.¹⁰

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10. Green Building Council of Australia: 1 Bligh Street: <http://bit.ly/1ABBSAe>.

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