

Green Codes and Green Building Fund Grant Program in DC



**A discussion with
MWCOCG**

September 18, 2014



DC's Progressive Green Policies



Green Building & Energy

- ✓ Green Building Act (2006)
- ✓ Energy Benchmarking (2008)
- ✓ Energy Efficiency Financing Act (2010)
- ✓ Distributed Generation Amendment Act (2011)
- ✓ Community Renewables Act (2013)
- ✓ Green Construction Codes (2014)



Green Infrastructure

- ✓ Stormwater Regulations (2013)
- ✓ Green Area Ratio (2013)

DC's "Green" Leadership

1st in nation in LEED and ENERGY STAR[®] certified buildings per capita (among cities over 200,000)

1st in nation in green power purchasing (DC government buys 100% green power)

1st large-scale bike share in United States

1st in nation in green roof square footage per capita

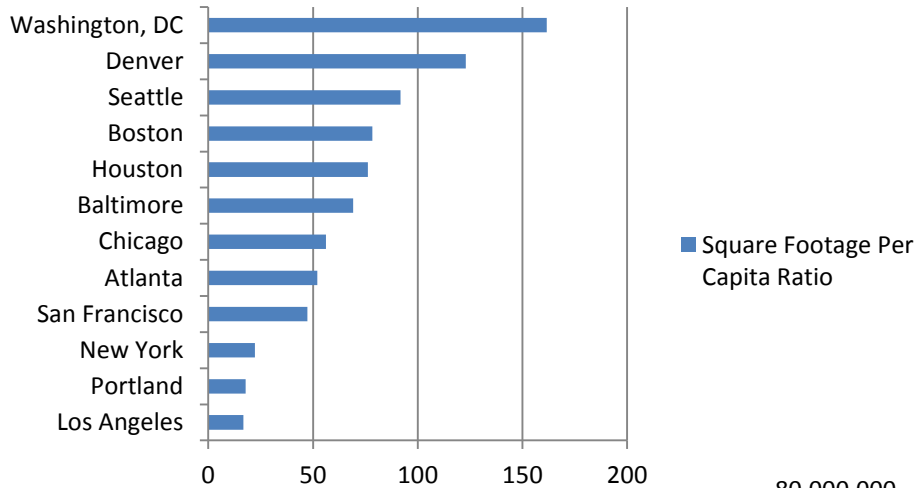
2nd in nation in urban parkland

2nd in mass transit (50% of District trips by transit, walking, or bike)

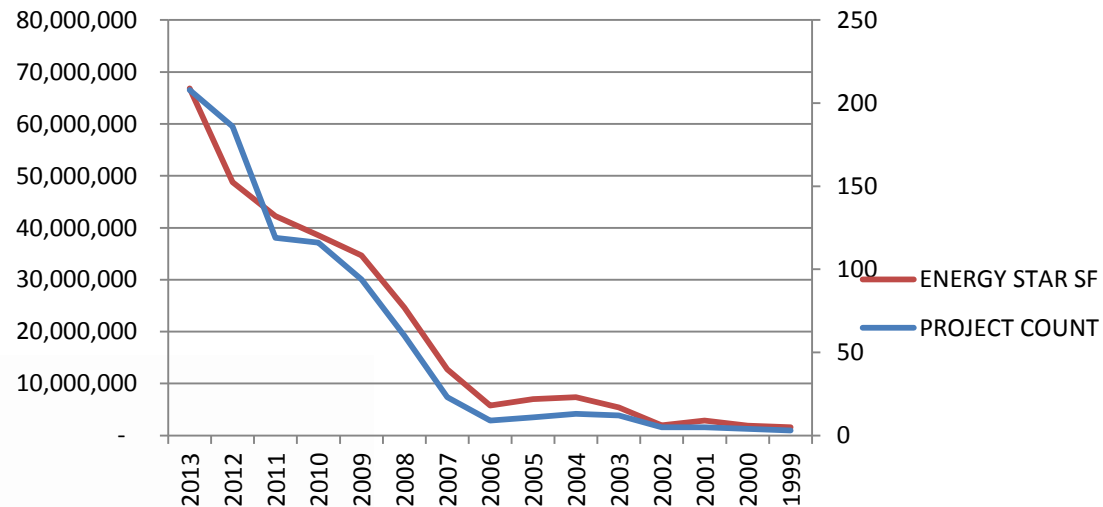


Green Buildings in the District

LEED Certification Square Footage Per Capita



ENERGY STAR Certification in the District, 1999-2013



Code Development Process



- Construction Code Coordinating Board (CCCB)
- CCCB oversees Technical Advisory Groups (TAGs)
- Public comment periods
- TAG and CCCB meet to review comments and make changes if necessary



Green Code Goals

- ✓ Green the construction code to the maximum extent practicable.
- ✓ Codify the best practices currently followed by green building leaders in the District.



Voting Green TAG Members

- ❖ *Bill Updike, DDOE*
- ❖ *Joe Winters, HOK*
- ❖ *Frank Mobilio, Jones Lang Lasalle*
- ❖ *Patrick Kunze, GHT Engineering*
- ❖ *Fulya Kocak, Clark Construction*
- ❖ *Ethan Landis, Landis Construction*
- ❖ *John Otto, Akridge*
- ❖ *Harrison Shelton, DCRA*
- ❖ *Nicola Whiteman, AOBA*



Other Active Green TAG Members

- ❖ *Dan Moring, IBC Engineering Services*
- ❖ *Ryan Meres, IMT*
- ❖ *Michael Walton, Perkins + Will*
- ❖ *Robert Hershey, Consultant*
- ❖ *Marc Fetterman, Consultant*
- ❖ *Anica Landreneau, HOK*
- ❖ *Jill Stern, DCRA*
- ❖ *Heather Langford, USGBC*
- ❖ *Jeremy Sigmon, USGBC*
- ❖ *Roger Chang, WRL Design*



DC Green Construction Code

- ❖ Scope – Covers all commercial projects 10,000 SF and above, and all multifamily residential projects 10,000 SF and larger, and 4 stories and higher

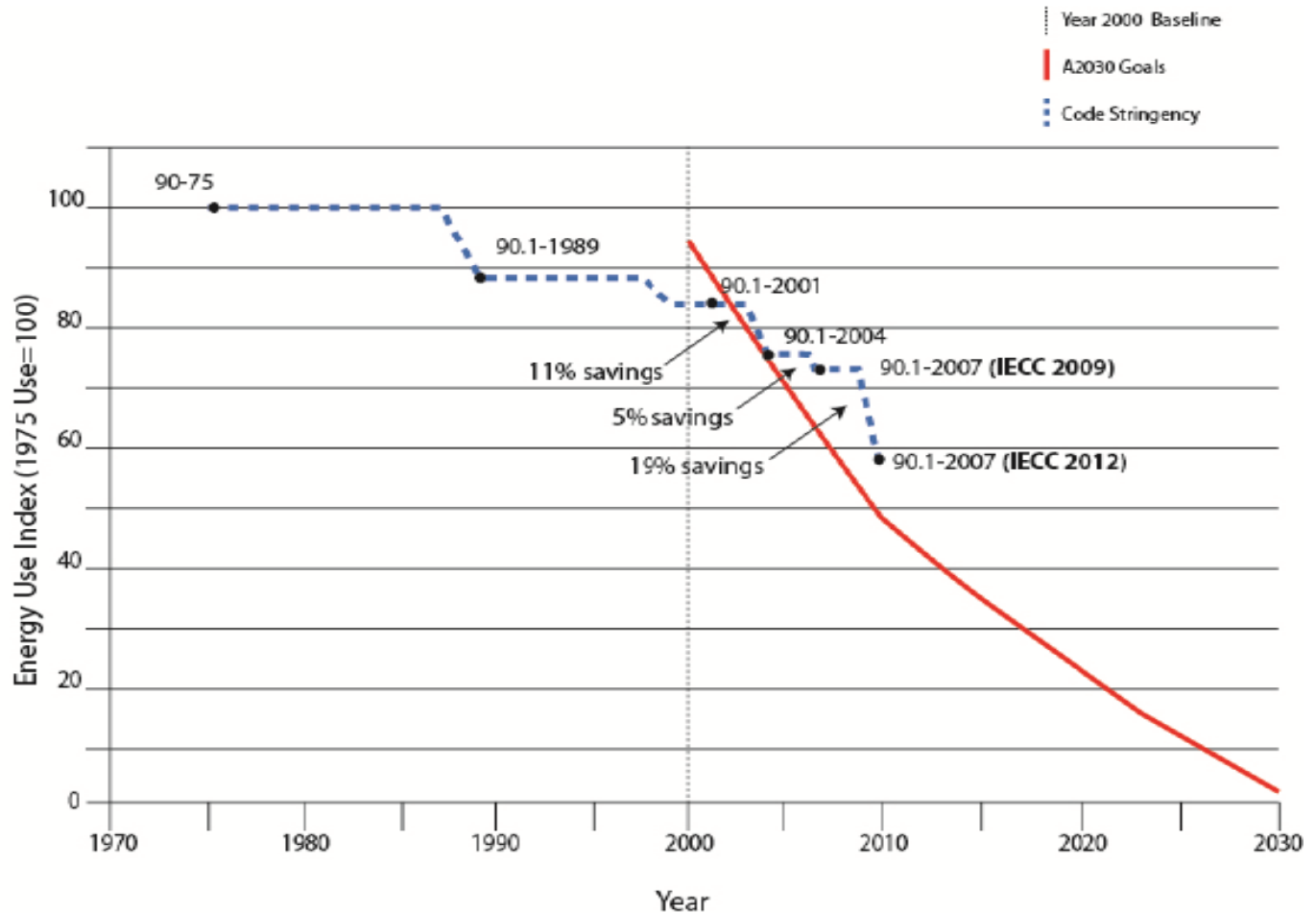
- ❖ LEED-like Sections:
 - ❖ Site Development and Land Use
 - ❖ Material Resource Conservation and Efficiency
 - ❖ Energy Conservation and Efficiency
 - ❖ Water Resource Conservation and Efficiency
 - ❖ Indoor Environmental Quality and Comfort
 - ❖ Commissioning

- ❖ Appendix A

- ❖ Alternative Compliance Paths: LEED, Enterprise Green Communities, ASHRAE 189.1, National Green Building Standard (ICC 700 – possible)



DC Energy Conservation Code

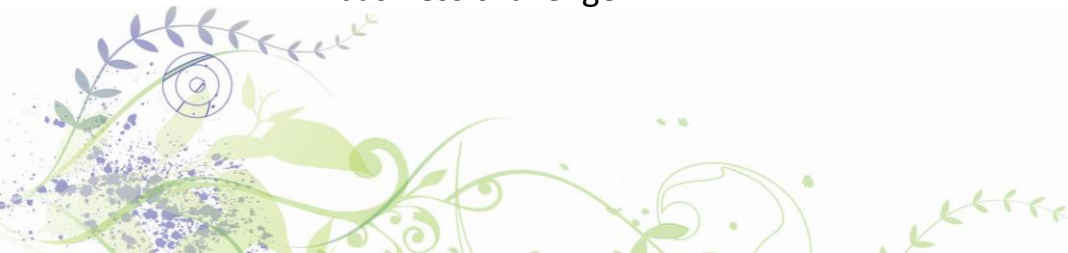


Green Building Grants

In FY 2013, DDOE created a Green Building Fund Grant Program in partnership with DCRA to fund innovation and research to drive deeper green buildings in DC

- FY13 Funded Projects
 - Study on Mortality and Urban Heat Island Effect
 - Development of Green Building Program Manual
 - Net Zero Energy/Water and Living Building Challenge Financial Study for DC

- FY14 Funded Projects
 - **Green Appraisal** – to train the banking and appraisal community on value of green buildings
 - **Greening the Multiple Listing Service (MLS) System** – to add green building attributes and analysis for real estate listings
 - **Smart Buildings Plan** -- to study the idea of creating city-wide models to test green building policy making decisions
 - **Quality Assurance for Benchmarking Scores** -- to ensure data quality for the ENERGY STAR benchmarking requirements
 - **DC Smarter Business Challenge** – to continue the District’s “green” business challenge



Green Building Grants

- FY15 Proposed Projects
 - DC Smarter Business Challenge (continued)
 - Green Multiple Listing Service (continued)
 - Green Appraisals (continued)
 - Green Building Displays (continued)
 - Microgrid/District Energy Research
 - Green Bank/Carbon Pricing/Incentives Study
 - Historic Building Green Guidelines
 - Energy Compliance Tool

- FY15 Additional Possibilities (if additional funding available)
 - Smart Building Plan Project (continued)
 - Benchmarking Analysis (continued)
 - Virtual Energy Audits
 - Zero Energy Pilot Projects
 - Sustainable DC Design Competition
 - Smarter Business Challenge Incentives



Net Zero/Living Building Study



First Costs

Building Type	Net Zero Energy	Net Zero Water	Living Building Challenge
Commercial - New (328,095 SF)	5-10%	0-4%	11-16%
Commercial - Retrofit (235,172 SF)	7-12%	1-6%	13-18%
Residential - New (329,164 SF)	14-19%	2-7%	22-27%

Energy Financials

Building Type	Deep ECM Only			Net Zero With ECM			Net Zero Without ECM		
	NPV	SPB	ROI	NPV	SPB	ROI	NPV	SPB	ROI
Office New Construction	(\$396,476)	11 yrs	9.10%	\$2,672,413	3.0 yrs	33.80%	\$2,508,026	3.3 yrs	30.30%
Multifamily New Construction	(\$1,772,741)	17.7 yrs	5.70%	\$3,192,398	3.0 yrs	33.10%	\$2,943,543	3.4 yrs	29.30%
Office Renovation	(\$137,039)	8.1 yrs	12.30%	\$1,260,704	2.7 yrs	36.80%	\$3,008,046	3.4 yrs	29.20%

Net Zero/Living Building Study



First Costs

Building Type	Net Zero Energy	Net Zero Water	Living Building Challenge
Commercial - New (328,095 SF)	5-10%	0-4%	11-16%
Commercial - Retrofit (235,172 SF)	7-12%	1-6%	13-18%
Residential - New (329,164 SF)	14-19%	2-7%	22-27%

NET ZERO WATER AND ECOLOGICAL WATER FLOW STRATEGIES

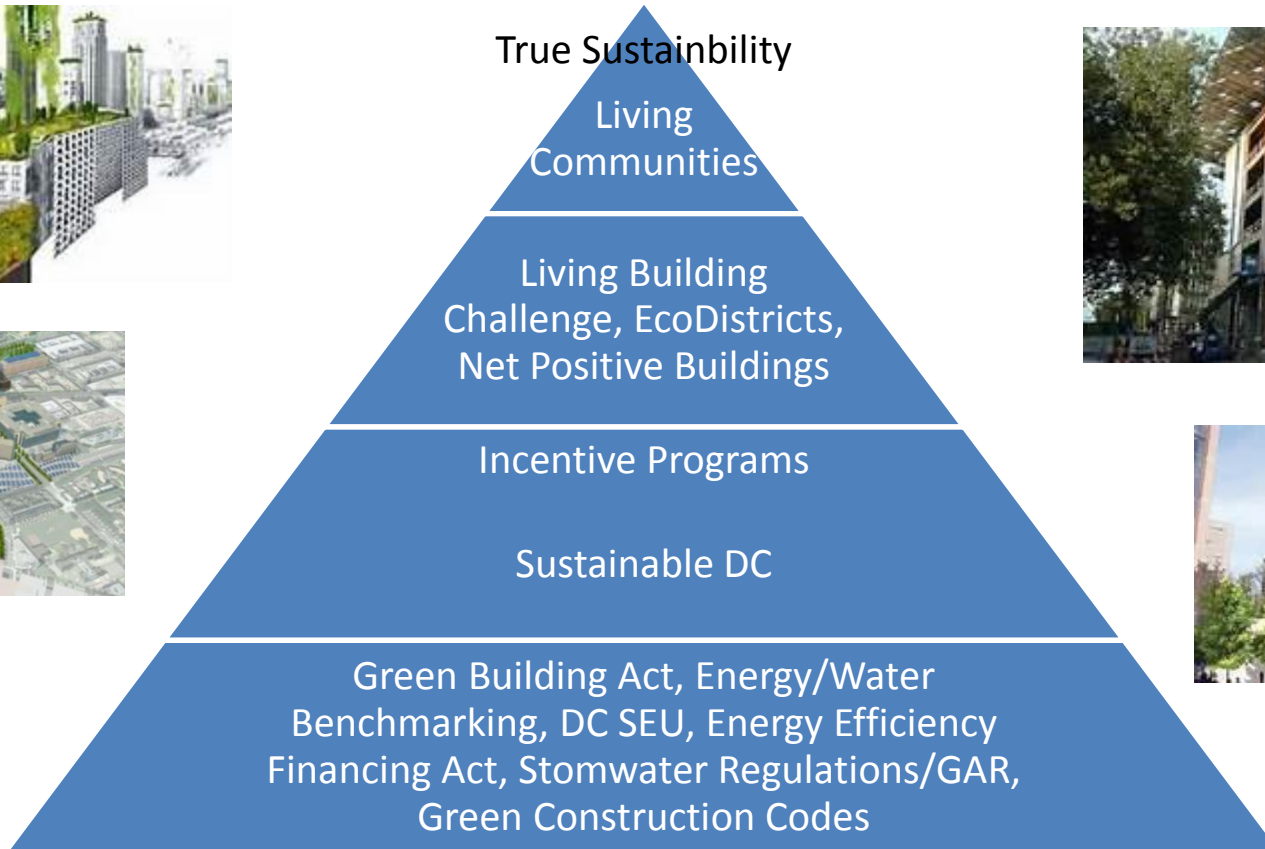
For each building, a storm and rainwater retention system was added via a tank in the basement. The walls and floor of this tank were waterproofed and structurally upgraded to meet the load of the water. Related pipes, pumps and greywater distribution (purple pipe) systems were also added.

	Assumed Incremental Cost	Cost Premium per SF	Cost Premium %	NPV	SPB	ROI
Office New Construction	\$1,190,133	\$3.80	1.3%	(\$116,953)	10.18	9.8%
Multi-Family New Construction	\$1,540,145	\$4.65	1.7%	(\$72,580)	21.22	4.7%
Office Renovation	\$1,846,100	\$7.85	3.1%	(\$94,808)	19.47	5.1%

Table E: Cost and Payback of NetZero Water Strategies

Note: \$2.00 per SRC was assumed for stormwater incentives.

Green Building Foundation



Questions?

Bill Updike

Green Building Specialist

District Department of the Environment

William.updike@dc.gov

202-535-1337

