

# ACEEE National Symposium on Market Transformation

Session : Influencing Market Change Coast to Coast



April 22, 2015



# DC's Progressive Green Building Policies

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## Green Building & Energy

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



## Green Infrastructure

- ✓ Stormwater Regulations (2013)
- ✓ Green Area Ratio (2013)
- ✓ Green Construction Codes (2014)

# DC's "Green" Leadership

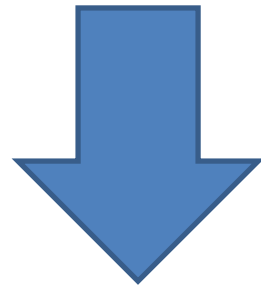
DISTRICT  
DEPARTMENT  
OF THE  
ENVIRONMENT



- ❖ **1<sup>st</sup> in nation among large cities in LEED and ENERGY STAR<sup>®</sup> certified square footage per capita by large margin**
- ❖ **1<sup>st</sup> in nation in total number of ENERGY STAR<sup>®</sup> buildings and total number of LEED projects**
- ❖ **1<sup>st</sup> in nation in green power purchasing for 5 years running**
- ❖ **1<sup>st</sup> in solar energy per capita among states**
- ❖ **1<sup>st</sup> in nation in green roof square footage per capita (2<sup>nd</sup> in total square footage)**
- ❖ **2<sup>nd</sup> in mass transit (50% of District trips by transit, walking, or bike)**



LEED Platinum Is Great,  
But It Isn't Enough  
to Get to This





# Path to True Sustainability

DISTRICT  
DEPARTMENT  
OF THE  
ENVIRONMENT



True Sustainability

Living  
Communities

Living Building  
Challenge, EcoDistricts,  
Net Positive Buildings

Net Zero Buildings  
Incentive Programs  
Sustainable DC

Green Building Act, Energy/Water Benchmarking,  
DC SEU, Energy Efficiency Financing Act,  
Stormwater Regulations, Green Construction Codes



# Green Building Fund Grants



In 2013, DDOE created a Green Building Fund Grant Program

## ➤ 2013 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

## ➤ 2014 Funded Projects

○ Green Appraisal

○ Greening the Multiple Listing Service (MLS) System

- Smart Buildings Plan (City-Wide Energy/Water/Waste/Etc. Models)
- Quality Assurance for Benchmarking Scores
- DC Smarter Business Challenge

## ➤ 2015 Funded Projects

- DC Smarter Business Challenge (continued)
- Green Multiple Listing Service (continued)
- Green Appraisals (continued)
- Benchmarking Analysis (continued)
- Green Building Displays (continued)

○ Microgrid/District Energy Potential Study for DC

○ Green Bank/Revenue Neutral Carbon Tax/Deep Green Incentives Study



# Green Building Fund Grants



## First Costs

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

## Financials Over Time

Building Type	Deep ECM Only			Net Zero With ECM		
	NPV	SPB	ROI	NPV	SPB	ROI
Office New Construction	(\$396,476)	11 yrs	9.10%	\$2,672,413	3.0 yrs	33.80%
Multifamily New Construction	(\$1,772,741)	17.7 yrs	5.70%	\$3,192,398	3.0 yrs	33.10%
Office Renovation	(\$137,039)	8.1 yrs	12.30%	\$1,260,704	2.7 yrs	36.80%

# Net Zero/Living Building Study



Building Type	First Costs	
	Net Zero Water	Living Building Challenge
Commercial - New (328,095 SF)	0-4%	11-16%
Commercial - Retrofit (235,172 SF)	1-6%	13-18%
Residential - New (329,164 SF)	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.



# Takeaways in DC

## ❖ Make it as easy as possible

- Mapdwell Solar Mapping
- Virtual Energy Audits

## ❖ Make it as smart as possible

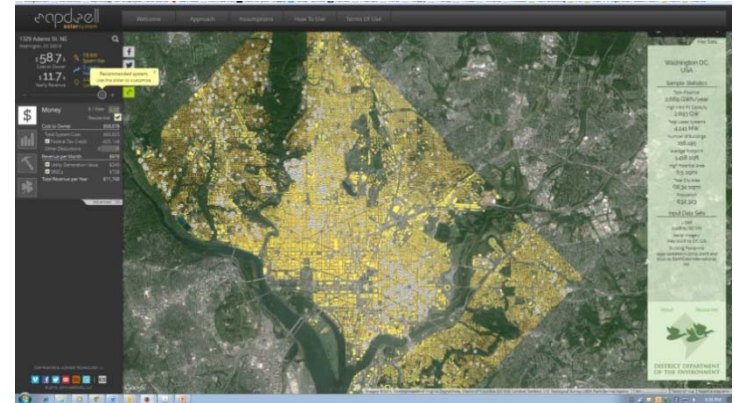
- Smart Roof Analysis
- Autodesk Partnership

## ❖ Make it as clean as possible

- DC Gov buys 100% clean grid power
- DC Gov building 46MW wind farm in PA
- DG Gov building 10-12 MW of solar on 50 buildings
- DC Gov also exploring district energy and microgrid opps

## ❖ Make it as deep green as possible

- Living Building Challenge Design Competition
- DC Public Library RFP with Living Building Challenge
- EcoDistricts – 3 Target Cities Projects in DC
- Living Community Challenge Plans
- Living DC Plan



# Contact Info

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