

EBA MEETING

**FORT MYERS, FL
JANUARY 17, 2011**



ASTM Building Energy Performance Assessment (BEPA) Standard E 2797

Presented by:

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ASTM BEPA Task Group Chairman

ASTM BEPA Standard E2797

Overview:

- Driving Forces
- What's the problem?
- What the BEPA standard accomplishes

ASTM BEPA Standard E2797

Driving Forces:

- Regulatory
 - Building energy use disclosure
 - Benchmarking against peers
- Business

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Regulatory Driving Forces:

Energy Performance Disclosure in EU (2003)

- California - AB 1103 (2007, effective 2011)
- District of Columbia (2008, effective 2010)
- Austin, TX (2008, effective 2011)
- Washington State (2009, effective 2011)
- Seattle, WA (2010, effective 2011)
- New York City, NY (2009, effective 2011)

- Additional **Cities** considering
 - Denver, Portland, San Francisco

- Additional **States** considering
 - IL, MA, MD, MI, MN, OH & OR

- Federal Legislation being discussed

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Business Driving Forces:

- More energy efficient buildings
 - Lower operating costs
 - Higher net operating income
 - More valuable
 - More attractive to tenants

- Less energy efficient buildings
 - Less competitive in the marketplace
 - In danger of obsolescence

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What's the problem?

- Prospective purchasers as part of due diligence are asking what is the “building’s energy consumption?”
- Pro Forma provided to lenders by buyers for financing has line item for utilities under building operating costs
 - Lenders want a “reasonable” and “realistic” value here
 - **No consistent methodology exists to provide answers**

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What's the problem? (cont.)

- Significant variability depending on:
 - Period of time chosen over which the data was collected (1 yr, 2 yrs, 3 yrs) and how it was calendarized
 - Whether or not changes in building occupancy was considered
 - How weather conditions were factored in and baseline conditions established
 - How building operating hours were considered
 - Whether or not major building renovations were considered

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What does the BEPA Standard accomplish?

- Standardizes the collection and reporting of energy consumption information for a building involved in a real estate transaction
- Provides a supplementary scope of work that can compliment property due diligence (e.g. Phase I or PCA)
- Use of the BEPA standard will facilitate improved benchmarking (by others)

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Report Deliverables

- Pro Forma (representative) building energy ***use***
- Pro Forma (representative) building energy ***cost***

- Projected range of building energy ***use*** for:
 - lower, upper and average case
- Projected range of building energy ***cost*** for:
 - lower, upper and average case

- Actual building energy ***use*** data for each year collected
- Actual building energy ***cost*** data for each year collected

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Use of BEPAs in the marketplace:

- Likely to be combined with an ASHRAE Level I Energy Audit and/or Benchmarking (BEPA Plus)
- ESCOs energy auditing (BEPA and BEPA Plus)
- Asset management of property portfolios (BEPA Plus)
- Property due diligence in acquisition or disposition (BEPA and BEPA Plus)
- Building energy use regulatory disclosure (BEPA)
- Support “energy efficiency” loans (BEPA Plus)

EBA MEETING

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ASTM BEPA Plus Case Study - Emerging Best Practices

Presented by:

Brian McCarter
Chairman & CEO



ASTM BEPA Plus Case Study

Overview of Emerging Best Practice Methodology:

- Stakeholder value received from ASTM BEPA
 - Prospective Buyer
 - Prospective Lender
 - Due Diligence Consultant

- Role of ASTM BEPA Standard
 - Foundational scope of work
 - Baseline & projected energy use & cost calculations
 - Complementary to existing benchmark & rating systems
 - Standardized reporting methodology

ASTM BEPA Emerging Best Practices – Buyer Perspective

Stakeholders value received:

Prospective Buyer – gains visibility to subject property's:

- Baseline and projected / pro forma energy use and cost profile
 - Considers impact of primary independent variables
 - Historical weather, occupancy, operating hours
- Benchmark to peer buildings
 - Energy consumption & cost performance comparisons
- Competitive position of asset compared to local market peer group
- Identify energy efficiency retrofit opportunities with compelling
 - ROI & payback term
 - Asset enhancement value
- Identify potential government & utility economic incentive programs to improve ROI

ASTM BEPA Emerging Best Practices – Lender Perspective

Stakeholders value received:

Prospective Lender – gains visibility to subject property & borrower characteristics:

- Property pro forma energy use & cost profile for lender underwriting
- Potential energy efficiency retrofit opportunities with compelling ROI
 - Incremental energy efficiency based loan opportunities
 - Borrower repayment ability enhanced due to lower operating expenses
 - Collateral value enhanced due to energy efficiency improvements
- Potential government (federal, state, local) & utility economic incentive programs to improve ROI on energy efficiency retrofit initiatives

ASTM BEPA Emerging Best Practices – Consultant Perspective

Stakeholders value received:

Due Diligence Consultant:

- Extension of core due diligence service line (PCA & ESA) to include BEPA
- Leverage installed client base for BEPA services:
 - Lenders (transactions & energy loan program support)
 - Buyers / investors (transactional BEPA)
 - Owners / managers (ongoing portfolio monitoring & optimization)
 - Sellers (energy disclosure compliance)
- Post closing value-add opportunities: (beyond transactional services)
 - Energy efficiency retrofits project management
 - Ongoing property & portfolio level monitoring & optimization
 - Smart deployment of capital improvement budget impacting energy

BEPA Plus Emerging Best Practice – “How it Works” Case Study

Collect Building Characteristics Data

- Class A, multi-tenant office building in pre-acquisition due diligence
 - 212,000 Sq. Ft.
 - Norwalk, CT



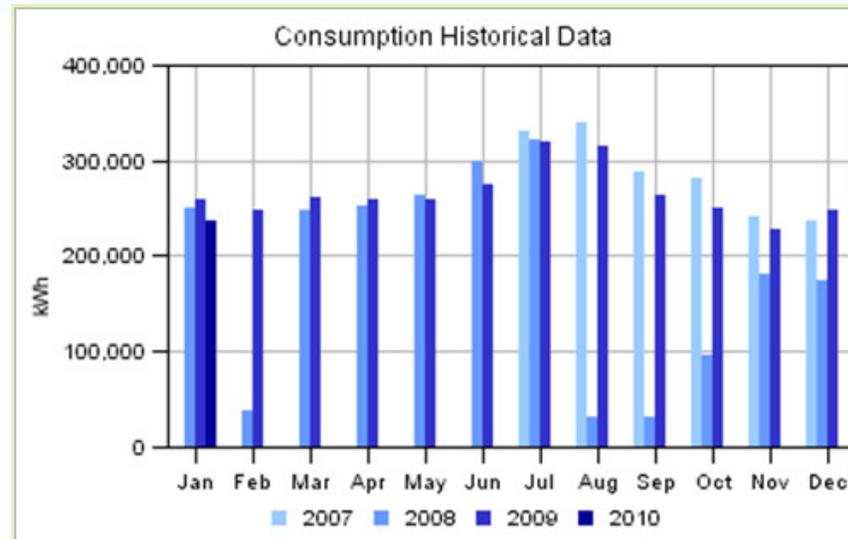
Main Space (Office)

Name	Value	Units
Office Gross Floor Area	212000.0	ft2
Office Weekly Operating Hours	85	h
Office Main Shift Workers	685.0	
Office Number of PCs	625	
Office Percent Heated	100	
Office Percent Air Conditioned	100	

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Collect Historic Monthly Utility Consumption & Cost Data:

- Electricity
- Fuels
- Normalize to Calendar Month

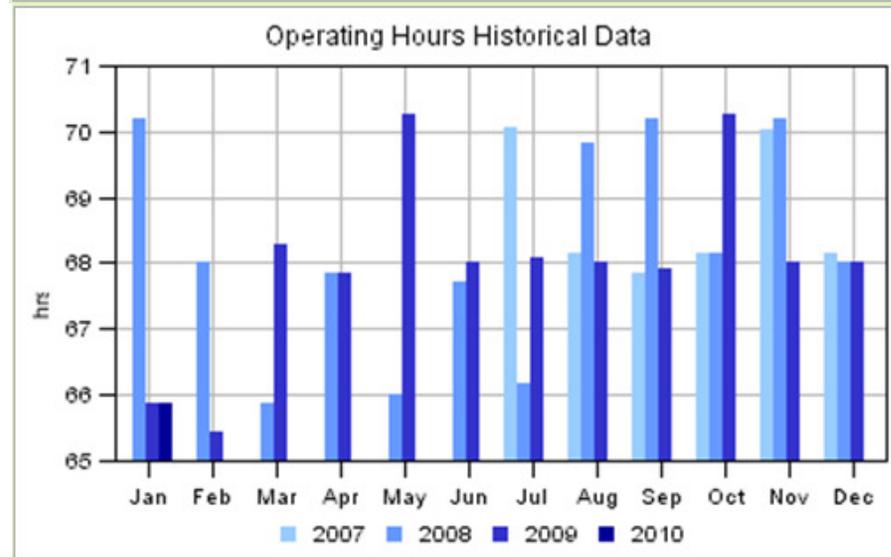
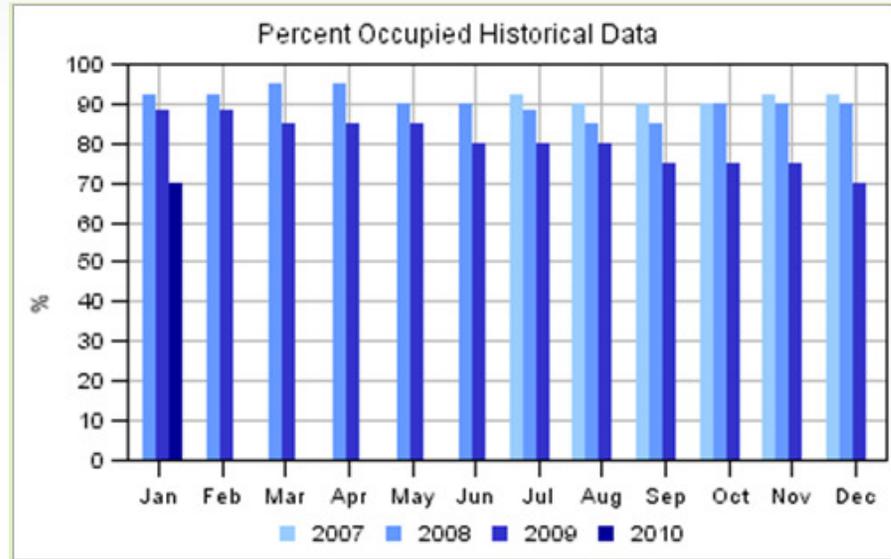


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Collect Historic Occupancy & Operating Hours Data

Primary Independent Variables

- Weather
- Occupancy
- Operating Hours



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Calculate Energy Baseline per ASTM BEPA Standard Methodology

- Total Energy Use & EUI
- Total Energy Cost & Cost/SF

Baseline Performance Indicators

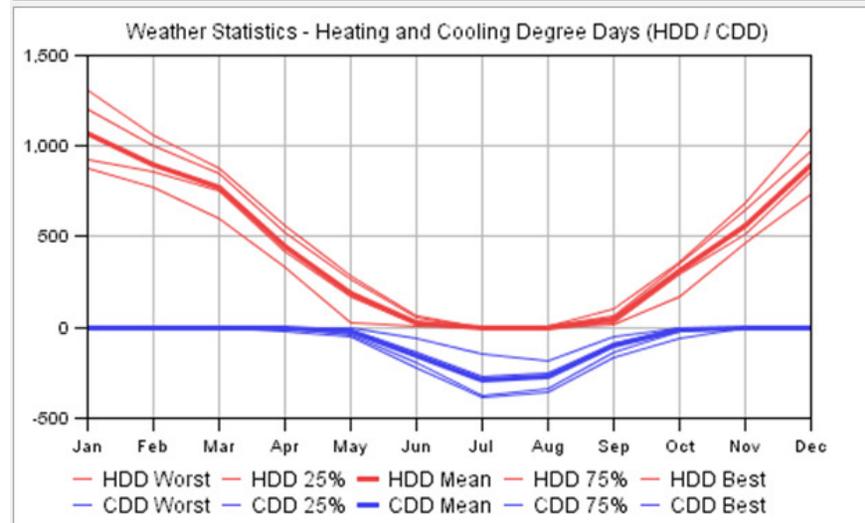
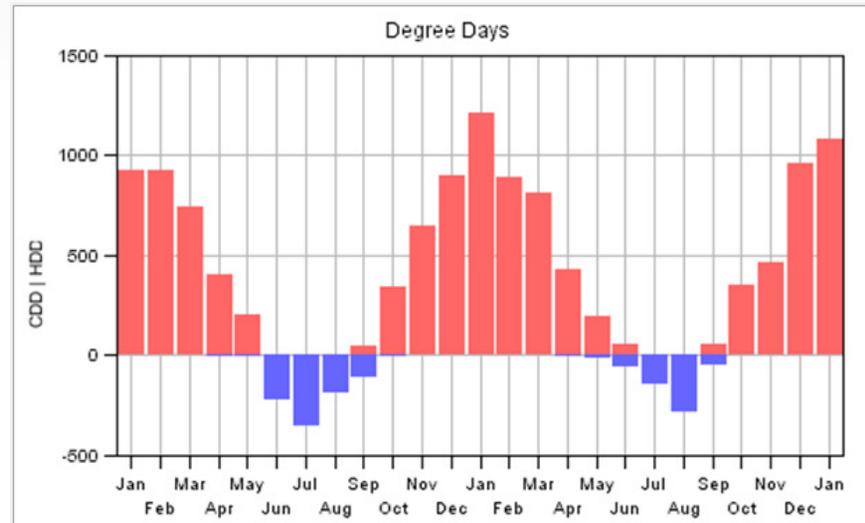
(for 12 months ending Jan 31, 2010)

Gross Floor Space:	203,698 ft ²
Total Energy Use:	20,584 mmBTU
Energy Use Intensity (EUI):	101.1 kBTU/ft ²
Total Energy Cost:	\$489,174
Energy Cost per SF:	\$2.40 /ft ²

BEPA Plus Emerging Best Practice – “How it Works” Case Study

Forecast Energy Use & Cost, considering independent variables impact

- Historic Weather
- Heating & Cooling Degree Days (HDD & CDD)
- Statistical Analysis over 10+ year period to determine
 - Best case
 - 25th Percentile
 - Mean
 - 75th Percentile
 - Worst case



BEPA Plus Emerging Best Practice – “How it Works” Case Study

Calculate Projected Range of Energy Use – Impact of Weather

- Best case
- 25th Percentile
- Mean
- 75th Percentile
- Worst case

Weather	Electricity Use (kWh)	Fuel Use (kBtu)	Total Energy Use (kBtu)	CDD	HDD	TOTAL DD
Best	3,231,392	6,222,550	17,249,031	440	4,096	4,536
25%	3,337,396	7,425,541	18,813,738	756	4,851	5,606
Mean	3,370,049	8,041,070	19,540,689	853	5,237	6,090
Median	3,370,995	8,143,352	19,646,197	856	5,302	6,157
75%	3,457,343	9,179,836	19,940,844	1,112	5,952	7,064
Worst	3,506,565	9,920,751	21,886,204	1,259	6,417	7,676
Baseline Data:						
Last 12 Mo.	3,526,749	8,550,940	20,585,266	548	5,302	5,850
% from Mean	4.6	6.3	5.3	-35.7	1.2	-3.9

BEPA Plus Emerging Best Practice – “How it Works” Case Study

Range of Energy Use – Impact of Occupancy & Operating Hours

	Cooling Degree Days (CDD)	Heating Degree Days (HDD)	Impact of Weather	
			Total Energy Use (kBTU)	Total EUI (kBTU/ft ²)
Average Weather Year	853	5,237	19,540,689	95.93

	Average
Occupancy Rate (%)	89.5
Operating Hours/Week	68.0
Energy Use Impact (kBTU)	20,680
EUI Impact (kBTU/ft²)	0.10
Pro Forma Energy Use (kBTU)	19,561,369
Pro Forma EUI (kBTU/ft²)	96.03

BEPA Plus Emerging Best Practice – “How it Works” Case Study

Calculate Projected Range of Energy Costs

- Best case
- 25th Percentile
- Mean
- 75th Percentile
- Worst case

Range of Building Energy Cost - Impact of Weather						
	CDD Best	CDD 25%	CDD Mean	CDD Median	CDD 75%	CDD Worst
HDD Best	\$432,078					
HDD 25%		\$456,244				
HDD Mean			\$466,139			
HDD Median				\$467,271		
HDD 75%					\$487,522	
HDD Worst						\$500,568
Baseline Data:						
Last 12 Mo.	\$489,174					
% from Mean	4.9					

BEPA Plus Emerging Best Practice – “How it Works” Case Study

Calculate Pro Forma Energy Use & EUI

- Energy Use & EUI in Average Weather Year with Average Occupancy & Operating Hours

Pro Forma Building Energy Use	Pro Forma Building Energy Use Intensity (EUI)
19,561,369 kBTU/yr	96.03 kBTU/ft²

BEPA Plus Emerging Best Practice – “How it Works” Case Study

Calculate Pro Forma Energy Cost

- Energy Cost in Average Weather Year with Average Occupancy & Operating Hours

Pro Forma Building Energy Cost	Pro Forma Building Energy Cost per SF
\$464,843	\$2.28 /ft ²

BEPA Plus Emerging Best Practice – “How it Works” Case Study

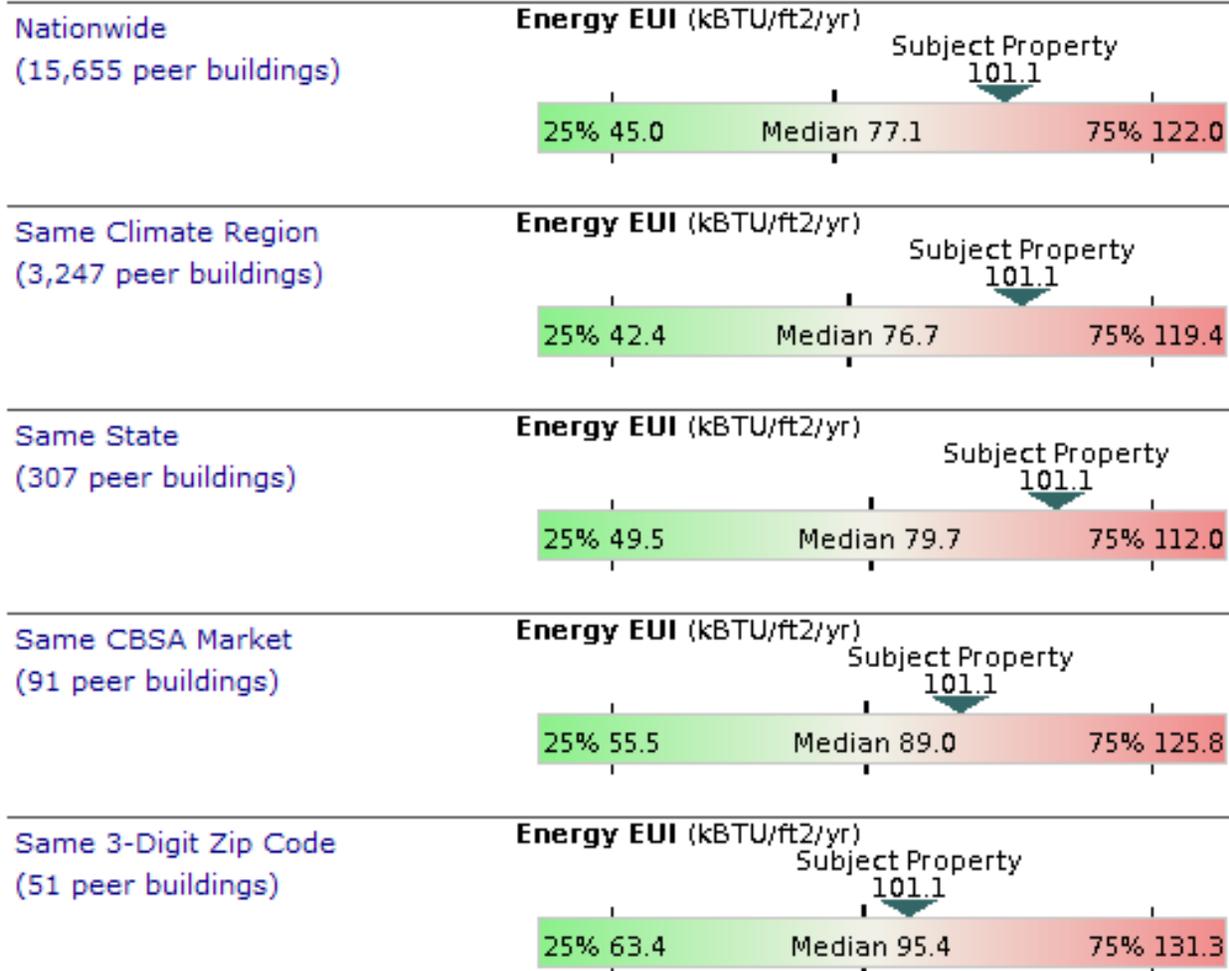
Benchmark Against Peer Buildings – Energy Use Intensity (EUI)

- National to Local Market Peer Group Comparisons

Energy EUI

SRS Peer Group Comparison (Data current through July 2010)

Property Type: Office

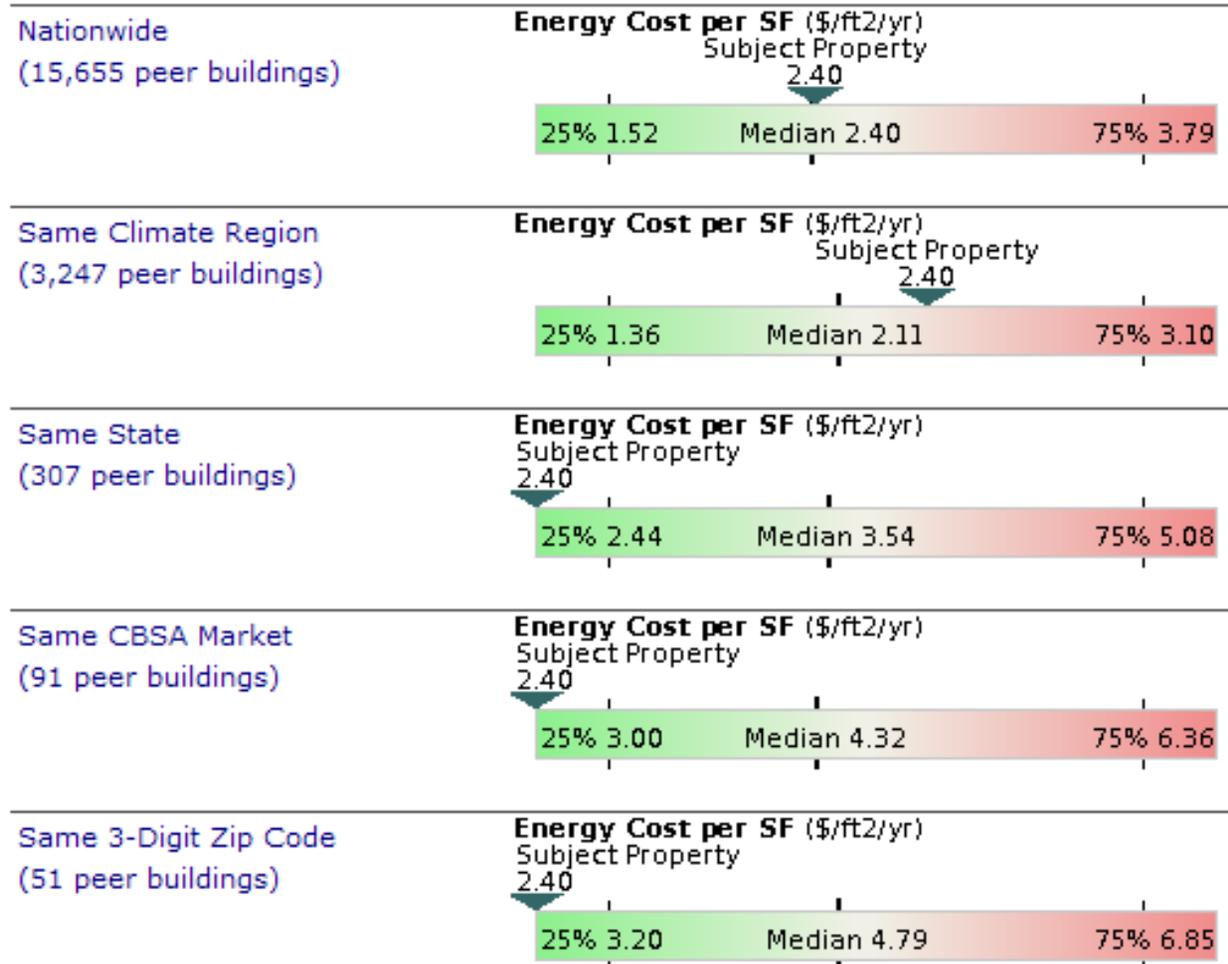


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Benchmark Against Peer Buildings – Energy Cost per SF

- National to Local Market Peer Group Comparisons

Energy Cost per SF SRS Peer Group Comparison (Data current through July 2010) Property Type: Office



BEPA Plus Emerging Best Practice – “How it Works” Case Study

Benchmark Against Peer Buildings – Potential Asset Value Impact

Peer Group Performance Distribution	Subject Property Potential EUI Savings (kBtu/ft ² /yr)	Subject Property Potential Annual Energy Cost Savings (\$/yr)	Subject Property Potential Asset Valuation Impact at Assumed Capitalization Rate				
			5.0%	6.0%	7.0%	8.0%	9.0%
25% Percentile	36.15	\$197,535	\$3,950,697	\$3,292,247	\$2,821,926	\$2,469,186	\$2,194,832
Median	2.68	\$14,647	\$292,937	\$244,114	\$209,241	\$183,086	\$162,743
Mean	N/A	N/A	N/A	N/A	N/A	N/A	N/A
75% Percentile	N/A	N/A	N/A	N/A	N/A	N/A	N/A

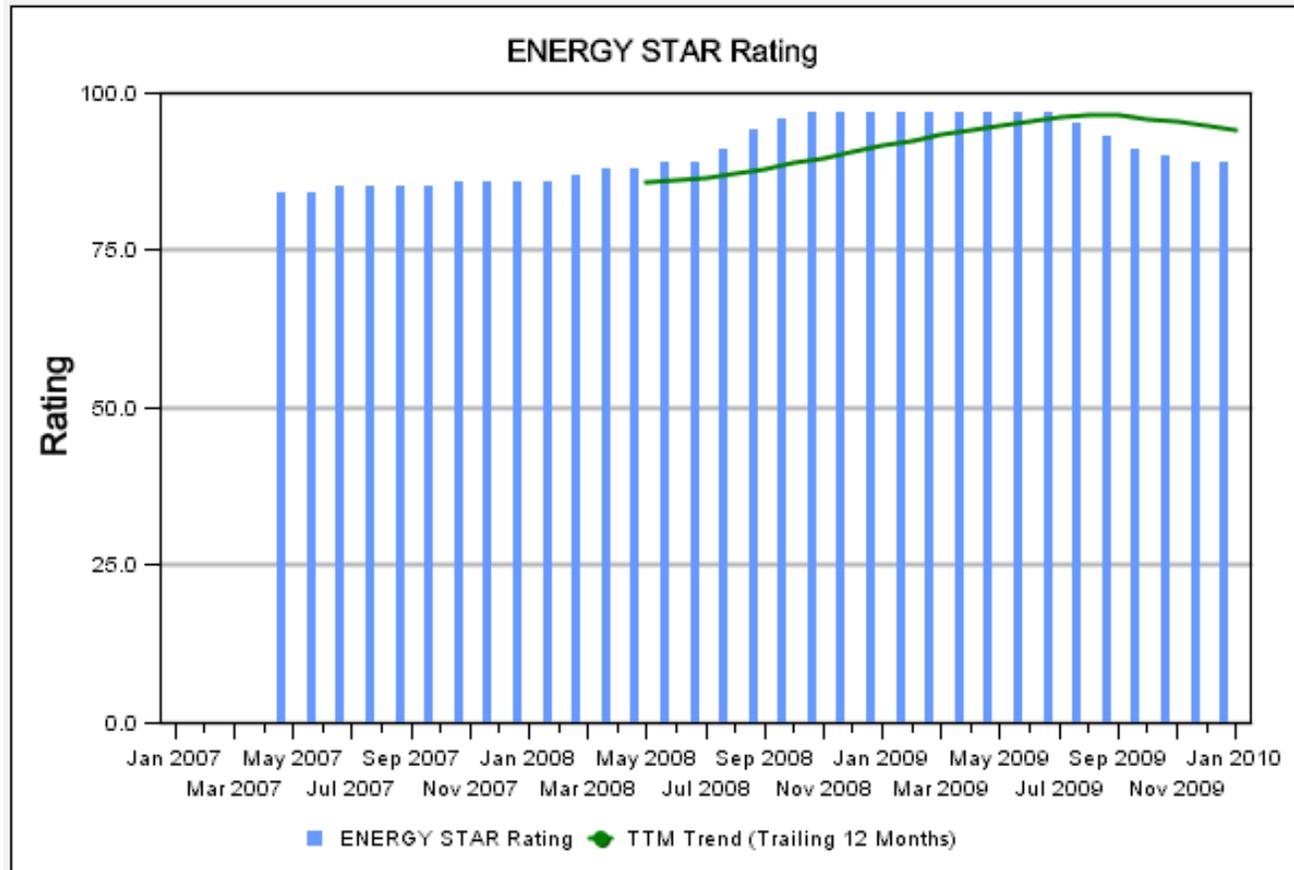
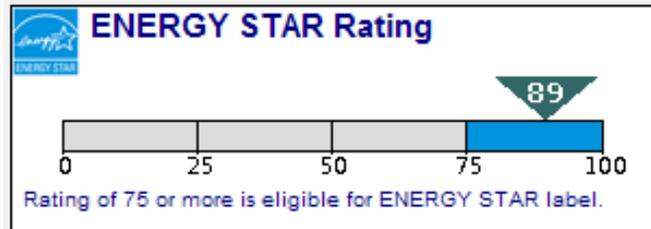
CBSA peer group performance data is current through July 2010.

Opportunity Quantification from Peer Building Benchmarking:

- Subject property performance lags CBSA peer group median & 25th%
- Potential impact of improving performance to meet CBSA peer group 25th%
 - \$197,535 annual energy cost savings
 - \$2.8 million asset value increase at 7% cap rate assumption

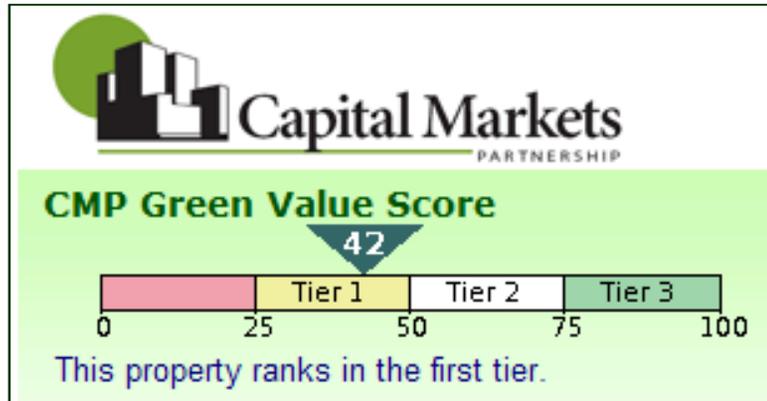
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Benchmark Against Peer Buildings – Energy Star Benchmarking



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Identify Specific Green Building Attributes that Enhance Asset Value



CO₂e Emissions (12 months)	
Total	Normalized
2,150	21.11
tons	lbs/ft ²

U.S. GREEN BUILDING COUNCIL
LEED®

	Value
LEED Certification Type	LEED-EBOM
LEED Certification Level	Silver
LEED Points	46
LEED AP	John Green

BEPA Plus Emerging Best Practice – “How it Works” Case Study

Analyze Retrofit Opportunities – ASHRAE Protocol

- ASHRAE Protocol Recommendations for Energy Cost Savings Measures
- Estimate ROI & Payback Term

Lighting Retrofit

Upgrade T-12 fluorescent lighting to T-8 lamps and ballasts.

Difficulty Moderate
Impacts Energy and Atmosphere

Installed Cost:	\$50,000 - \$55,000
Est. Annual Savings:	\$10,000
Est. Annual CO2 Savings:	90 tons
Est. Payback Term:	2.5 - 3.0 years
Asset Value Increase:	\$112,931 - \$107,931
CAP Rate:	7.25%
ROI:	40.0 - 33.3%

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Research Government & Utility Economic Incentive Programs

■ Local, State & Federal Government Incentive Programs

■ Utility Company Energy Incentive Programs



CONNECTICUT

Incentives/Policies for Renewables & Efficiency



[See Federal Incentives](#)



[See All Summaries](#)



[See Residential Incentives Only](#)

Financial Incentives

Industry Recruitment/Support

- [CCEF - Operational Demonstration Program](#)
- [New Energy Technology Program](#)

Leasing Program

- [CCEF - CT Solar Lease](#)

Local Loan Program

- [New Generation Energy - Community Food Service Efficiency Lending Program](#)
- [New Generation Energy - Community Solar Lending Program](#)

Property Tax Incentive

- [Property Tax Exemption for Renewable Energy Systems](#)

Sales Tax Incentive

- [Sales and Use Tax Exemption for Energy-Efficient Products](#)
- [Sales and Use Tax Exemption for Solar and Geothermal Systems](#)

State Grant Program

- [CCEF - Community Innovations Grant Program](#)
- [CCEF - On-Site Renewable DG Program](#)

State Loan Program

- [CHIF - Energy Conservation Loan](#)
- [DPUC - Low-Interest Loans for Customer-Side Distributed Resources](#)

State Rebate Program

- [CCEF - Geothermal Rebate Program](#)
- [CCEF - Solar PV Rebate Program](#)
- [CCEF - Solar Thermal Incentive Program](#)
- [CEEIP - Commercial and Industrial Rebate Program](#)

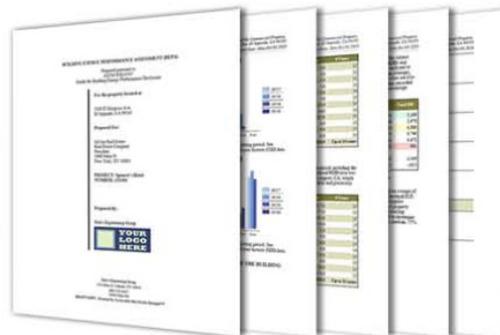
Utility Grant Program

- [Connecticut Light & Power - Energy Conscious Blueprint Grant Program](#)
- [The United Illuminating Company - Energy Conscious Blueprint Grant Program](#)

BEPA Plus Emerging Best Practice – “How it Works” Case Study

Incorporating Industry Best Practice Analytics in BEPA Plus Report

- ASTM BEPA Standard Methodology – Baseline & Projected Energy Use & Cost
- Benchmark Against Peer Buildings – local, regional & national peer group KPIs
- Energy Star Rating – energy efficiency rating to national peer group
- CMP Green Value Score – identify green building attributes that add asset value
- LEED Certification Status – type, level, category points distribution
- Economic Incentive Programs – enhance retrofits ROI & payback
- ASHRAE Level I & II Recommendations Protocol – retrofits with compelling ROI
- Carbon Emissions Calculation – associated with building’s energy use



BEPA Plus Emerging Best Practices – Meeting Stakeholder Needs

BEPA Plus is Good Business – Potential Win/Win/Win for 3 Stakeholders

- **Prospective Buyers – Visibility to:**
 - Projected / pro forma energy use & cost
 - Competitive position of property relative to local peer buildings
 - Energy retrofit opportunities with compelling ROI & payback

- **Prospective Lender – Visibility to:**
 - Risks & opportunities relative to energy performance for loan underwriting
 - Energy efficiency based loan opportunities
 - Increased NOI - borrower repayment ability & asset value enhancement

- **Due Diligence Consultants:**
 - Extend (PCA & ESA) service line to include BEPA to core clients
 - Post closing value-add opportunities – beyond transactional services
 - ongoing monitoring & optimization
 - smart deployment of capital improvement budget impacting energy

ASTM BEPA Standard

Emerging Best Practices



Presented by:

Brian McCarter
Chairman & CEO