

The Green Capital Needs Assessment

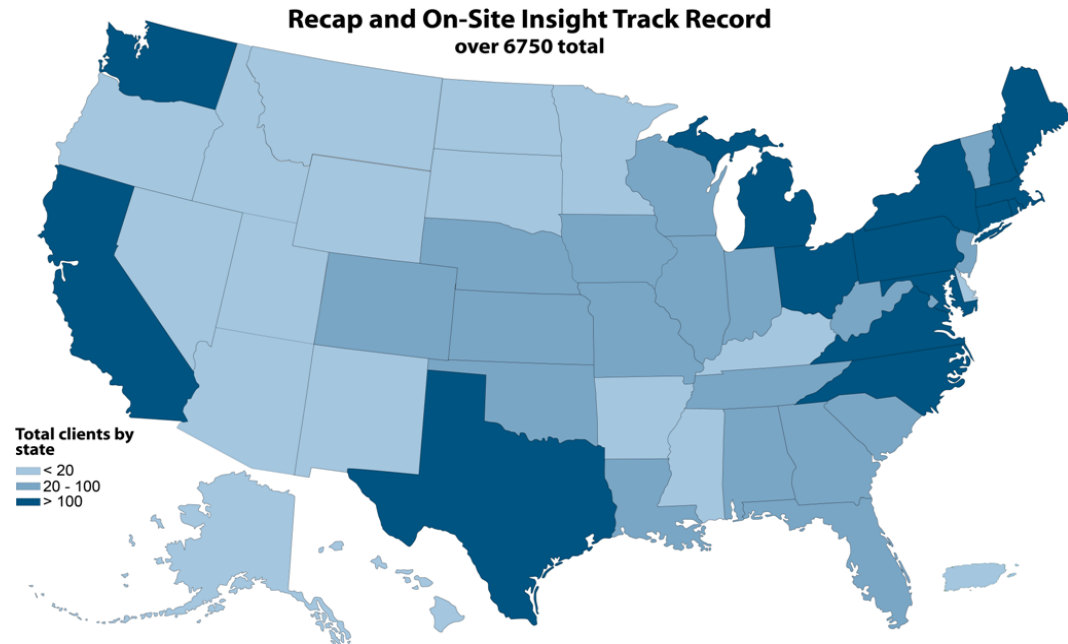
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Recap Real Estate Advisors and On-Site Insight (OSI)

20-Year Track Record

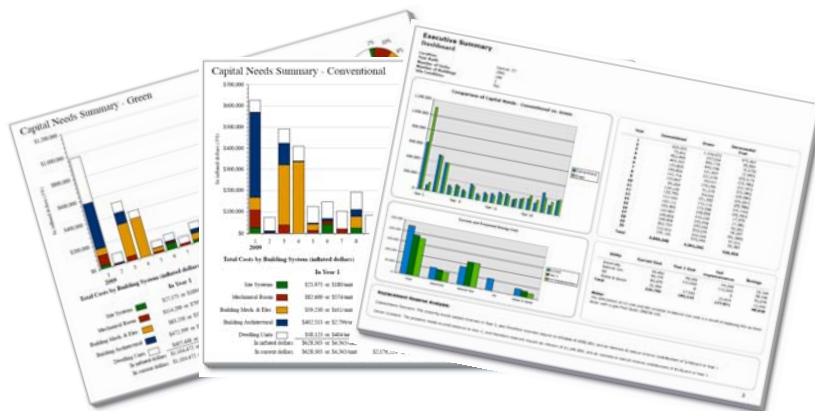
- Recap:
 - Has closed \$2.7 billion in transactions on over 750 multifamily properties
 - Asset manages +\$1.3 billion in multifamily investments
 - Developed underwriting for \$200 million Fannie/HUD demonstration program in '90s
- OSI:
 - Created and owns EUL tables adopted by Fannie Mae
 - Has completed more than 6,000 capital needs assessments
 - Now provides energy audits and green capital needs assessments



Recap and On-Site Insight provide services to wide variety of owners, investors, lenders, regulators, and policy makers.

Green Capital Needs Assessment Overview

- Designed for retrofit lending pilot
 - Developed with Enterprise and with USGBC review
 - Complies with the Enterprise Retrofit Audit Protocol
- Investment grade report, which includes:
 - 20-year capital needs assessment including reserve needs
 - Comprehensive energy audit
 - Detailed financial analysis of potential green improvements
 - Indoor environmental quality (IEQ) analysis
 - Green recommendations integrated into capital and reserve plan



Who is using the GCNA?

- Enterprise Community Partners, Inc.
 - 25 reports to date
 - In final underwriting for first 4 or 5
- MSHDA - Reinvestment and Innovation Program
 - 25 reports to date; program requirement
 - Using Section 1602 funds to recapitalize and retrofit
 - 19 properties approved - \$74 million in funding
- Owners and property managers
 - Used in variety of capacities
 - Transactional or operational



GCNA - Key Concepts

EWCMs – Energy and Water Conservation Measures

- Direct impact on energy or water consumption
- Boilers, lighting, insulation, low-flow shower heads...

GMs – Green Measures

- Direct impact on indoor environmental quality, increased durability, and/or increased expected useful life (EUL)
- No direct impact on energy or water consumption
- Low VOC paint, wood flooring, wood cabinetry...

The Three Basic Alternatives – what are costs?

- Existing
- Conventional
- Green

GCNA - The Process

Field Inspection - Comprehensive building inspection by a capital needs professional

Energy Modeling - Detailed modeling of energy and water usage of the building as a whole

Financial Analysis - Distillation of results into recognized financial metrics: Green NPV, IRR, SIR

Preliminary Report - Integration of analysis into a capital plan and reserve projections

Joint Review – Determination of accepted measures and timing

Final Report – Incorporates client feedback

The Process - Field Inspection

- Each GCNA auditor has undergone intensive TREAT training and is BPI certified (Energy Analyst and Multifamily)
- Prior to inspection, the auditor will analyze historical utility usage to identify inconsistencies and areas for improvement
- Similar to a CNA, the auditor will examine:
 - 100% of the site and mechanical rooms
 - a representative sample of the units
 - up to 170 major building systems
- Diagnostic Testing
 - Infrared imaging
 - Combustion efficiency testing
 - Air flow and ventilation
 - Indoor Air Quality testing (CO₂, temperature, humidity)

The Process - Energy Modeling

- Build a comprehensive energy model (we use TREAT - Targeted Retrofit Energy Analysis Tool)
- Reconcile calculated loads against historical usage
- Model retrofit packages
- Incorporate interactivity – the whole is less than the sum of the parts
- Estimate energy savings based on:
 - Existing vs. conventional vs. green
 - Building construction and property attributes
 - Climate and location

Payback Analysis

Existing – Gas-fired low-pressure steam boiler (73% efficiency)

Conventional – Gas-fired low-pressure steam boiler (80% efficiency)

Green – Gas-fired high-efficiency condensing hydronic boiler (96% efficiency)

	Existing	Conventional	Green
Implementation Cost	\$ -	\$ 6,300	\$ 14,900
Estimated Useful Life	8	25	20
Annual Energy Usage (Therms)	5,738	5,134	4,370
Cost per Therm	\$ 1.55	\$ 1.55	\$ 1.55
Annual Energy Cost	\$ 8,894	\$ 7,958	\$ 6,774
Annual Savings		\$ 936	\$ 2,120
Incremental Savings			\$ 1,184
Simple Payback		6.7	7.0
Incremental Payback			7.3
SIR		3.7	2.8

Life Cycle Cost Analysis

ECONOMIC RETURN ANALYSIS

Conventional Product:

Atmospheric Low-Pressure Steam

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit Cost	Total Cost	EUL	First Year	Inflated	Discounted
Install/Replace	Atmospheric LP Steam	1	\$6,300.00	\$6,300	25	1	\$7,614	\$6,951
Maintain	Annual Service	1	\$1,000.00	\$1,000	1	2	\$46,575	\$15,390
Maintain	Steam Air Vents	12	\$125.00	\$1,500	4	4	\$15,936	\$5,441
Maintain	Steam Trap	1	\$350.00	\$350	4	1	\$3,980	\$1,538
Utility Cost	Natural Gas Usage	5,134	\$1.55	\$7,958	1	1	\$378,591	\$130,425
							\$452,696	\$159,744

Green Product:

HE Condensing Hydronic w/Distribution System

Cost over Life Cycle (EUL)

Action	Description	Quantity	Unit Cost	Total Cost	EUL	First Year	Inflated	Discounted
Install/Replace	HE Condensing Boiler	1	\$8,200.00	\$8,200	20	1	\$13,348	\$10,340
Install/Replace	Distrib Piping/Baseboard	1	\$6,700.00	\$6,700	30	1	\$6,700	\$6,700
Maintain	Annual Service	1	\$250.00	\$250	2	1	\$5,859	\$2,097
Utility Cost	Natural Gas Usage	4,370	\$1.55	\$6,774	1	1	\$322,252	\$111,016
							\$348,159	\$130,154

ECONOMIC RETURN ANALYSIS

Green NPV	\$29,590
Green IRR	37.2%

(Calculated with a discount rate of 8% and inflation rate of 3%)

PRODUCT RECOMMENDATION

Recommendation based on Economic Return Analysis

Green Product:	HE Condensing Hydronic w/Distribution System
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Life Cycle Cost Analysis

Remaining Useful Life of Existing Product	8
Replacement Year	9

Immediate Replacement

			1						Cost over Life Cycle (EUL)	
Action	Description	Quantity	Unit Cost	Total Cost	EUL	First Year	Inflated	Discounted		
Install/Replace	HE Condensing Boiler	1	\$8,200.00	\$8,200	20	1	\$13,348	\$10,340		
Install/Replace	Distrib Piping/Baseboard	1	\$6,700.00	\$6,700	30	1	\$6,700	\$6,700		
Maintain	Annual Service	1	\$250.00	\$250	2	1	\$5,859	\$2,097		
Utility Cost	Natural Gas Usage	4,370	\$1.55	\$6,774	1	1	\$322,252	\$111,016		
							\$348,159	\$130,154		

Replacement at End of Remaining Useful Life

			9							
Action	Description	Quantity	Unit Cost	Total Cost	EUL	First Year	Inflated	Discounted		
Install/Replace	HE Condensing Boiler	1	\$8,200.00	\$8,200	20	9	\$11,757	\$5,920		
Install/Replace	Distrib Piping/Baseboard	1	\$6,700.00	\$6,700	30	9	\$4,277	\$4,134		
Maintain	Annual Service	1	\$250.00	\$250	2	9	\$4,764	\$1,225		
Utility Cost	Natural Gas Usage	4,370	\$1.55	\$6,774	1	9	\$262,020	\$64,841		

Expenses for Current Product Through Useful Life

Utility Cost	Natural Gas - Existing	5,738	\$1.55	\$8,894	1	1	\$79,088	\$60,630		
Maintain	Air Vents, Traps, Stm Blr	1	\$2,250.00	\$2,250	1	1	\$20,008	\$15,338		
							\$381,913	\$152,088		

Timing NPV	\$21,934
Timing IRR	43.72%

(Calculated with a discount rate of 8% and inflation rate of 3%)

Replacement Year:	1
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Green Improvement Plan

Measure	Product Type	Upfront Cost	Annual Savings				Total \$	Timing ²
			Electric \$	Gas \$	Oil \$	Water & Sewer \$		
Recommended EWCMs								
Interactive Group								
EWCM 1 Boiler (L Street)	Green	14,900		2,120			2,120	Immediate
EWCM 2 Boiler (M Street)	Green	12,400		570			570	Future
EWCM 3 Boiler (H Street)	Green	8,050		487			487	Future
EWCM 4 Boiler (T Street)	Green	8,050		1,034			1,034	Immediate
EWCM 5 Boiler (B Street)	Green	11,500		2,240			2,240	Immediate
EWCM 6 Boiler (K Street)	Green	12,420		2,109			2,109	Future
EWCM 10 Entry Doors	Green	27,350		977			977	Immediate
EWCM 11 Wall Insulation (K Street/B Street/H Street)	Green	43,050		4,664			4,664	Immediate
EWCM 12 Wood Windows, Sidelites	Green	5,100		270			270	Immediate
Interactive Subtotal ¹		142,820	0	13,015	0	0	13,015	
EWCM 7A/B Pump Motors	Green	4,700	223				223	Immediate
EWCM 8 Domestic Hot Water (B Street)	Green	6,850		654			654	Immediate
EWCM 9 Domestic Hot Water (K Street)	Green	6,850		2,442			2,442	Immediate
EWCM 13 Entry Lighting Photocell Controls	Green	600	112				112	Immediate
EWCM 14 Toilets - Units	Green	11,550				504	504	Future
EWCM 15 Thermostats - Units	Green	11,550		4,645			4,645	Immediate
EWCM Subtotal		184,920	335	20,756	0	504	21,595	
Recommended GMs								
GM 1 Exterior Siding	Green	120,960						Immediate
GM 2 Exterior Porches	Green	6,000						Immediate
GM 3 Roof Shingles	Green	7,735						Future
GM 4 Vestibule Vinyl Tile	Green	827						Immediate
GM 5 Dwelling Unit Vinyl Tile	Green	106,405						Immediate
GM 8 Original Kitchen Countertops	Green	4,800						Immediate
GM 9 New Kitchen Countertops	Green	15,000						Future
GM								
GM Subtotal		261,727						
Total		446,647	335	20,756	0	504	21,595	

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