The Expansion of the Rating Method to Account for Lighting, Appliances, and On-Site Energy Production

2005 RESNET Conference



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Analysis Approach

- **1. REM**/*Rate*[™] software
- 2. Four climates: Chicago, Miami, Baltimore, San Diego
- 3. 2000 sf home
- 4. 80 and 86 point homes (classic HERS score)



Analysis Approach

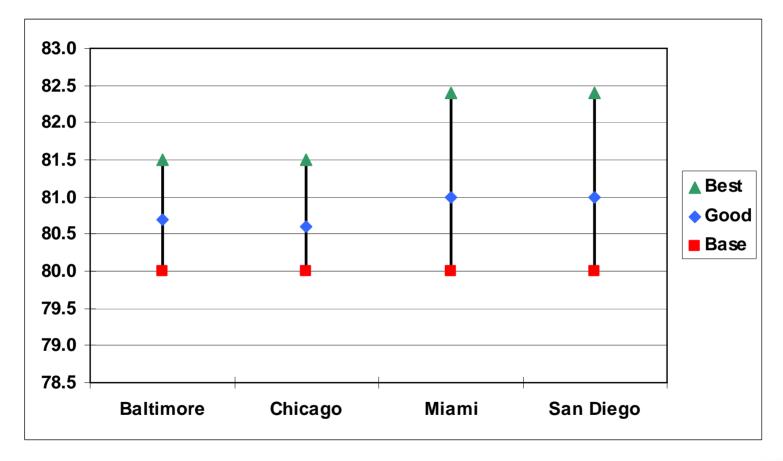
1. Three levels of efficiency

1. Base

- 1. Proposed HERS reference home values
- 2. Refrigerator: 775 kWh/yr
- 3. Dishwasher: 0.46 EF (cycles/kWh)
- 4. % Fluorescent: 10.0
- 2. Good
 - 1. Refrigerator: 651 kWh/yr, 16% reduction is average Energy Star
 - 2. Dishwasher: 0.64 EF, 39% increase is average Energy Star
 - 3. % Fluorescent: 50.0
- 3. Best
 - 1. Refrigerator: 388 kWh/yr, 50% reduction is best Energy Star
 - 2. Dishwasher: 1.29 EF, 181% increase is best Energy Star
 - 3. % Fluorescent: 100.0
 - 4. 2 kW PV system (86 point home only)

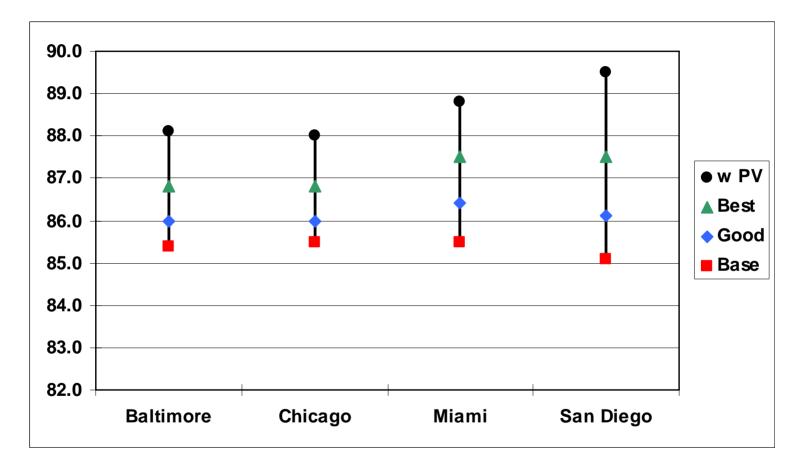


Expanded Rating Scores for Home w/ Classic Score of 80 Points





Expanded Rating Scores for Home w/ Classic Score of 86 Points



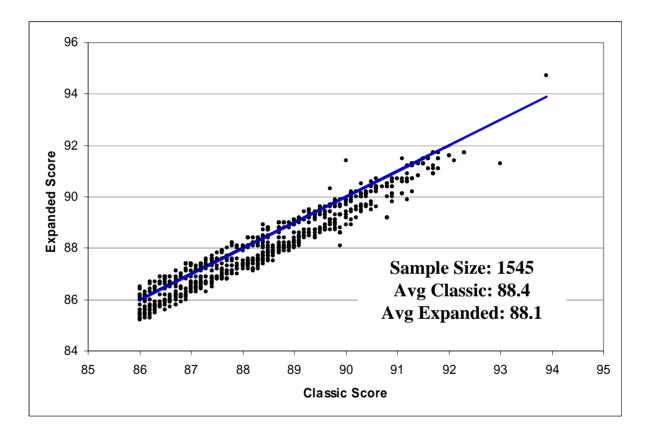


Massachusetts Pilot Project 2004 Data

- 1. Number of participating homes: 1,855
- 2. Number of Energy Star refrigerators: 935 (50%)
- 3. Number of Energy Star dishwashers: 1258 (68%)
- 4. Number of Energy Star light fixtures: 6262 (3.4)



Massachusetts Pilot Project Expanded vs Classic Rating Scores



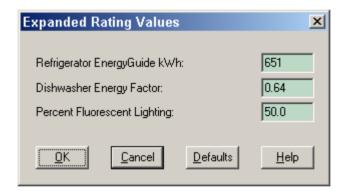
ARCHITECTURAL ENERGY Integrated Engineered Solutions



REM/Rate v 12.0 Expanded Rating Score - CZ 3.blg File Go To Site Libraries Reports Graph Export	Options Help
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Lights & Appliances © Use Default Loads Oven/Range Fuel:	Oversize Factors Rotate Windows/Skylights
Clothes Dryer Fuel: C Perform Detailed Audit Lights & Appliances Properties Summary	Logos in Reports Binding Adjustment For Reports ✓ Display Batch Log Report
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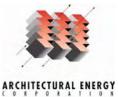


Quick Analysis	×
Energy Surface Area Compliance	
Codes IECC 2004 Performance: Passes IECC 2003 Performance: Passes IECC 2000 Performance: Passes IECC 2000 Performance: Passes IECC 1998 Performance: Passes IECC 1998 Performance: Passes IECC 1998 Performance: Passes IECC 1995 Performance: Passes MEC 1995 Performance: Passes MEC 1992 Performance: Passes MEC 1992 Performance: Passes ASHRAE 90.2 Performance: Passes Warnings! Warnings!	
Warnings!	
View Warnings <u>C</u> lose <u>P</u> rint	





Home Energy Rating Certificate	Rating Numbe Certified Energy Rate Dat Rating Ordered Fo	r: e;		
ΑΑΑΠ	Estimated Annual Energy Cost			
	Use	MMBtu	Cost	Percer
4 Stars Plus	Heating	33.4	\$201	15%
	Cooling	8.0	\$259	19%
Uniform Energy Rating System Energy Efficient	Hot Water	17.1	\$85	69
1 Star 1 Star Plus 2 Stars Plus 3 Stars 3 Stars Plus 4 Stars 4 Stars Plus 5 Stars 5 Stars Plus	Lights/Appliances		\$646	47%
8 19 20-39 40-49 50-59 60-69 70-79 80-82 85-85 86-89 90-100	Photovoltaics		\$0	09
Classic HERS Score: 85.2 / Expanded HERS Score: 85.3	Service Charges		\$195	14%
	Controc Offici goo			
0012 1 0010	Total		\$13.97	100%
General Information	Total		\$1387	100%
General Information Conditioned Area: 2000 sq. ft. HouseType: Single-family detached		no mooto the		100%
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