Early Results of Benchmarking of Minnesota's Multifamily Buildings

Duluth Energy Design Conference
Wednesday, February 26, 2013
Janne Flisrand, Patrick Smith, Billy Weber

In accordance with the Department of Labor and Industry's statute 326.0981, Subd. 11,

"This educational offering is recognized by the Minnesota Department of Labor and Industry as satisfying 1.5 hours of credit toward Building Officials and Residential Contractors continuing education requirements."

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Learning Objectives

-understand benchmarking and its application in multi-family housing
-understand the range of energy and water usage in MN MF buildings
-understand the different utility payment structures in MF buildings
-highlight usage range as a function of utility payment structures
-explore ways owners are using the tool
-understand how benchmarking can help owners set goals and evaluate potential upgrades, and monitor energy as part of operations
-understand the practical and policy conservation implications of different utility payment structures in MF buildings

Session Outline

Introduction to Benchmarking and Minnesota Pilot Project

Introduction and Tour of the Benchmarking Tool

Understanding Energy Use - What Does the Data Show?

Benchmarking Evaluating Improvements

Engagement - Motivating action/staff engagement

Informing Good Policy

- Barriers and Opportunities for progress

EnergyScoreCards Minnesota



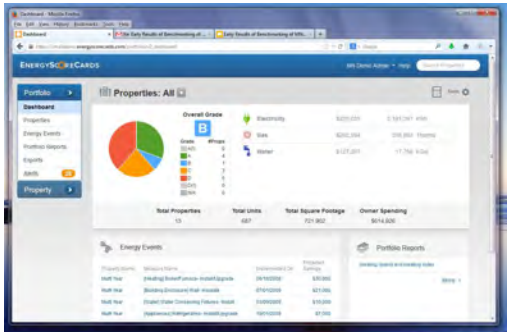

EnergyScoreCards Minnesota is a two-year effort to implement web-based energy and water benchmarking and tracking at multifamily buildings in Minnesota. The project aims to demonstrate that ***engaging*** multifamily owners, property managers and tenants in actively managing energy use can measurably ***reduce utility spending, energy and water consumption and carbon emissions***.

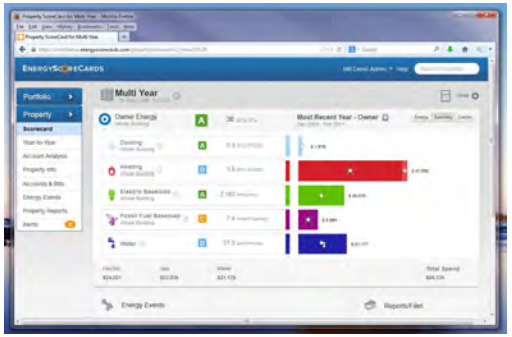
Benchmarking

Energy Benchmarking is the process of comparing one residential building energy use to a larger group or industry standard. Why?

- Understand performance against the average
- Understand areas of weakness within a company's portfolio
- Track and control budget
- Effectively manage portfolio and target savings

EnergyScoreCards System





Residential Building Specific

Online/Web accessed

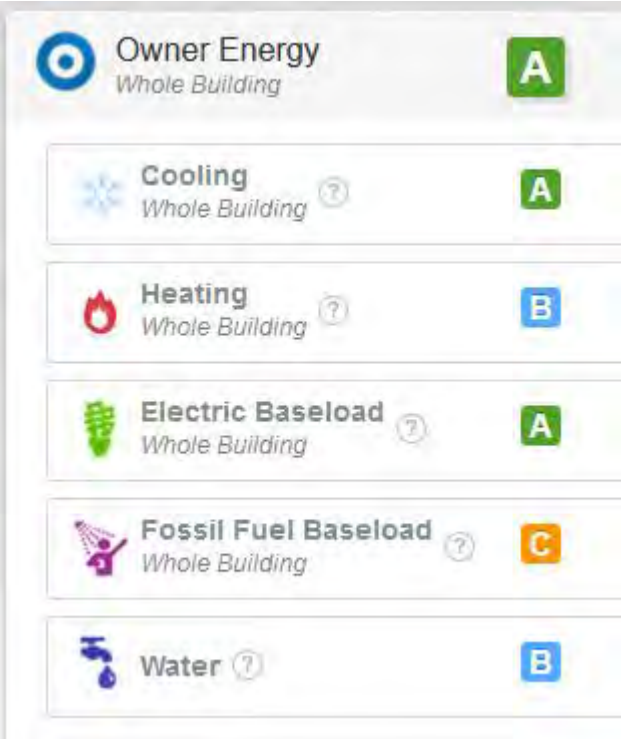
Portfolio Based

Automated Utility Data Refresh

Analysis Tools - property + portfolio

Improvement Tracking + Analysis

ESC - Basic Property Information



Property Type

Building Type/Occupancy

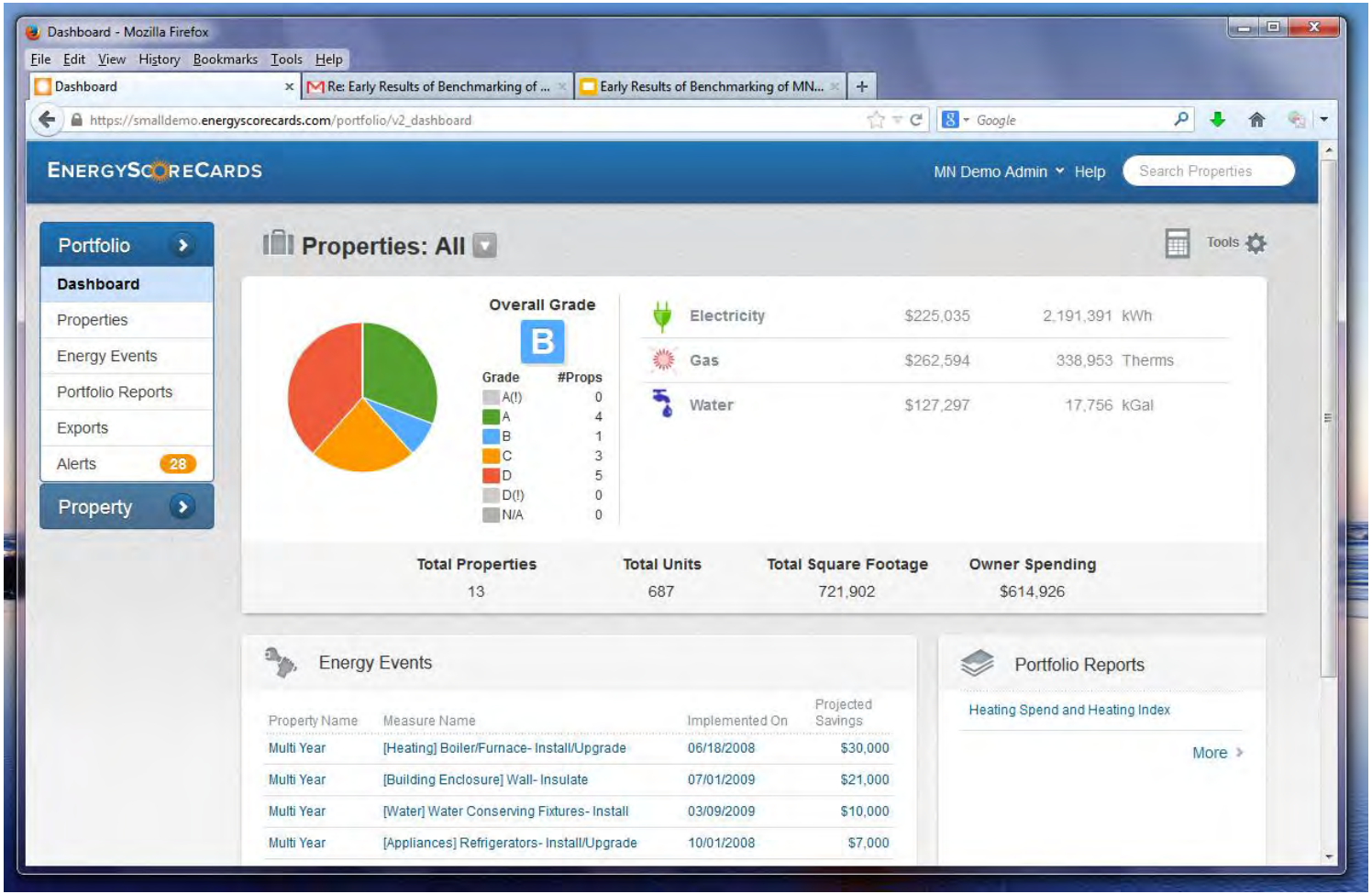
Square Footage

Units

Bedrooms

Payment Structure

Fuels


Dashboard - Mozilla Firefox
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Dashboard
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Early Results of Benchmarking of MN...
https://smalldemo.energyscorecards.com/portfolio/v2_dashboard
Google
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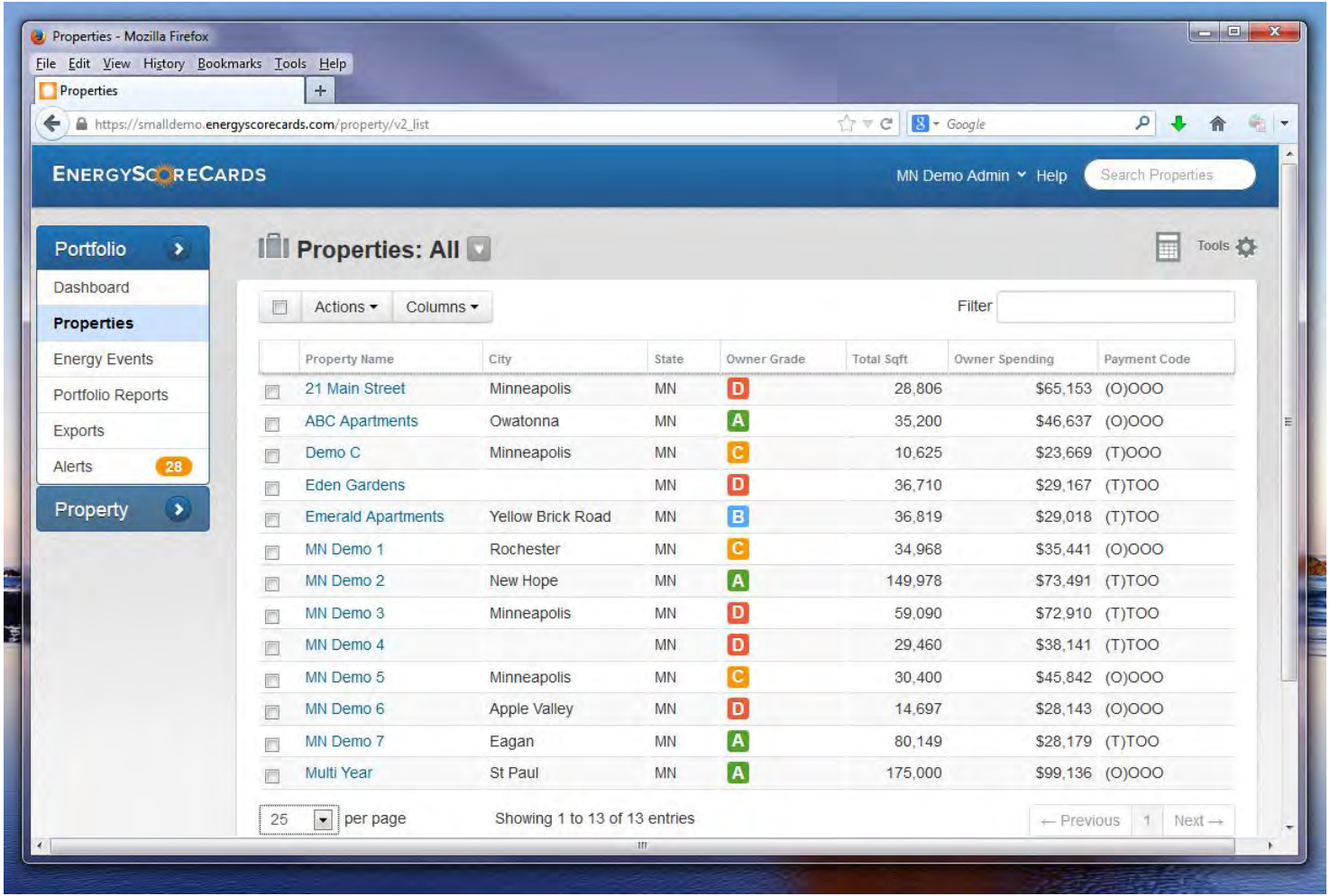
MN Demo Admin
Help
Search Properties
Portfolio
Dashboard
Properties
Energy Events
Portfolio Reports
Exports
Alerts 28
Property
Properties: All
Tools
Overall Grade
B
Grade #Props
A(!) 0
A 4
B 1
C 3
D 5
D(!) 0
N/A 0
Electricity $225,035 2,191,391 kWh
Gas $262,594 338,953 Therms
Water $127,297 17,756 kGal
Total Properties 13
Total Units 687
Total Square Footage 721,902
Owner Spending $614,926
Energy Events
Property Name Measure Name Implemented On Projected Savings
Multi Year [Heating] Boiler/Furnace- Install/Upgrade 06/18/2008 $30,000
Multi Year [Building Enclosure] Wall- Insulate 07/01/2009 $21,000
Multi Year [Water] Water Conserving Fixtures- Install 03/09/2009 $10,000
Multi Year [Appliances] Refrigerators- Install/Upgrade 10/01/2008 $7,000
Portfolio Reports
Heating Spend and Heating Index
More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Properties
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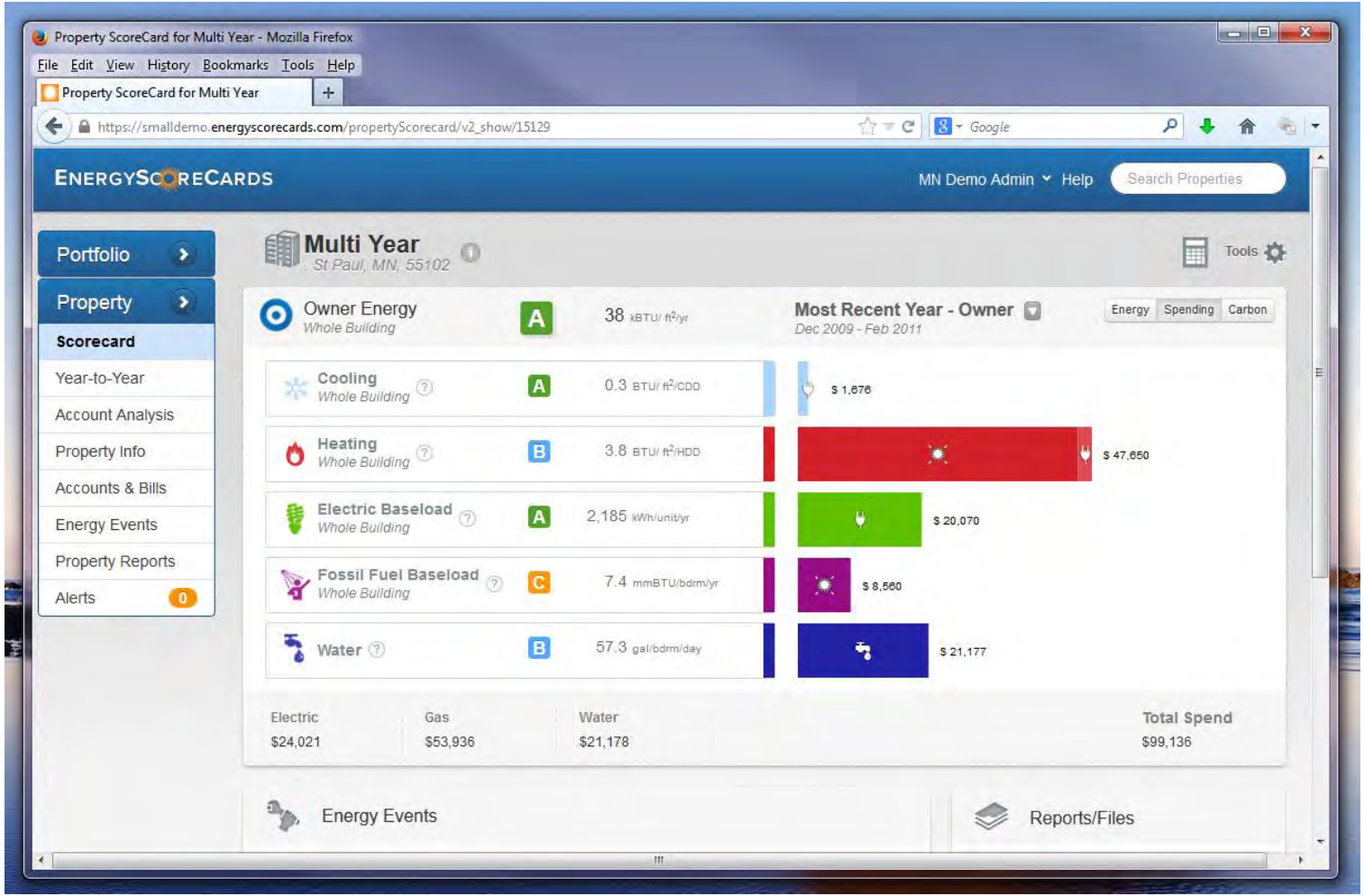
Google
ENERGYSCORECARDS
MN Demo Admin
Help
Search Properties
Portfolio
Dashboard
Properties
Energy Events
Portfolio Reports
Exports
Alerts 28
Property
Properties: All
Tools
Actions
Columns
Filter
Property Name
City
State
Owner Grade
Total Sqft
Owner Spending
Payment Code
21 Main Street Minneapolis MN D 28,806 $65,153 (O)OOO
ABC Apartments Owatonna MN A 35,200 $46,637 (O)OOO
Demo C Minneapolis MN C 10,625 $23,669 (T)OOO
Eden Gardens MN D 36,710 $29,167 (T)TOO
Emerald Apartments Yellow Brick Road MN B 36,819 $29,018 (T)TOO
MN Demo 1 Rochester MN C 34,968 $35,441 (O)OOO
MN Demo 2 New Hope MN A 149,978 $73,491 (T)TOO
MN Demo 3 Minneapolis MN D 59,090 $72,910 (T)TOO
MN Demo 4 MN D 29,460 $38,141 (T)TOO
MN Demo 5 Minneapolis MN C 30,400 $45,842 (O)OOO
MN Demo 6 Apple Valley MN D 14,697 $28,143 (O)OOO
MN Demo 7 Eagan MN A 80,149 $28,179 (T)TOO
Multi Year St Paul MN A 175,000 $99,136 (O)OOO
25 per page
Showing 1 to 13 of 13 entries
← Previous 1 Next →


Property ScoreCard for Multi Year - Mozilla Firefox
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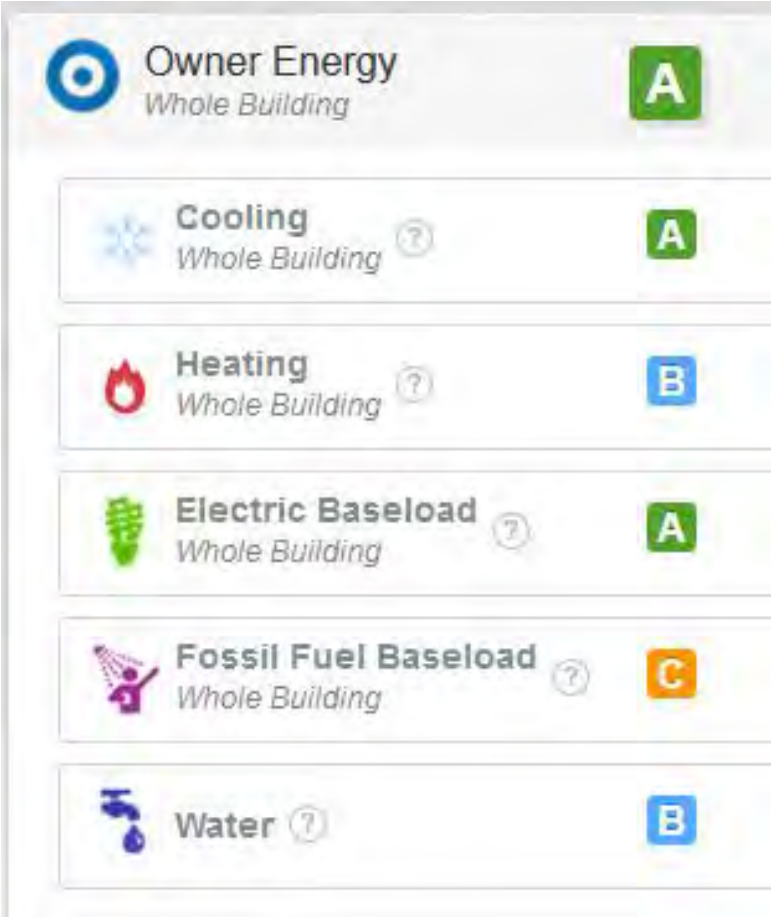
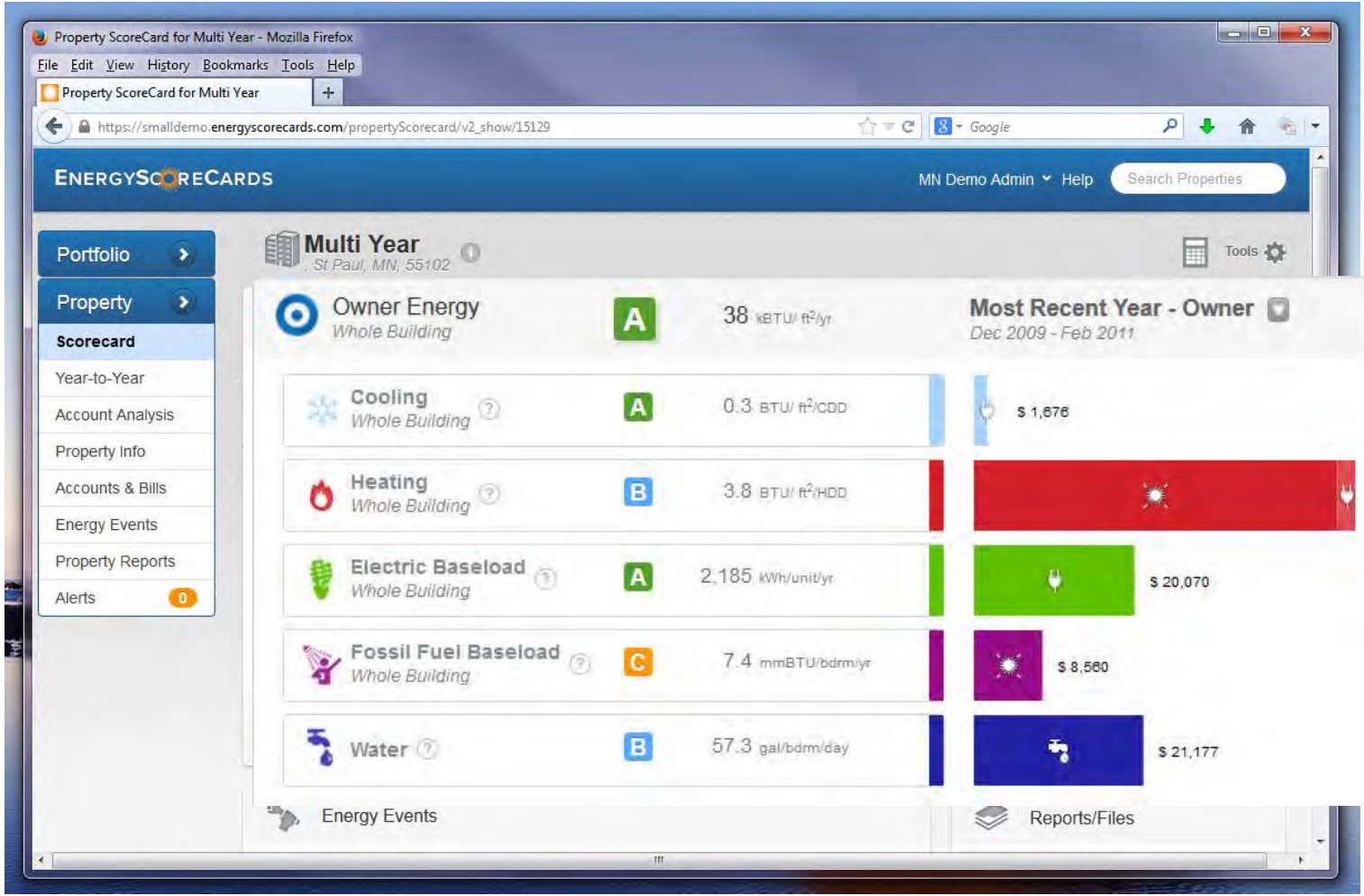
Property ScoreCard for Multi Year
https://smalldemo.energyscorecards.com/propertyScorecard/v2_show/15129
Google
ENERGYSCORECARDS
MN Demo Admin
Help
Search Properties
Portfolio
Property
Scorecard
Year-to-Year
Account Analysis
Property Info
Accounts & Bills
Energy Events
Property Reports
Alerts 0
Multi Year
St Paul, MN, 55102
Tools
Owner Energy
Whole Building
A
38 kBTU/ ft²/yr
Most Recent Year - Owner
Dec 2009 - Feb 2011
Energy
Spending
Carbon
Cooling
Whole Building
A
0.3 BTU/ ft²/CDD
$ 1,676
Heating
Whole Building
B
3.8 BTU/ ft²/HDD
$ 47,650
Electric Baseload
Whole Building
A
2,185 kWh/unit/yr
$ 20,070
Fossil Fuel Baseload
Whole Building
C
7.4 mmBTU/bdrm/yr
$ 8,560
Water
B
57.3 gal/bdrm/day
$ 21,177
Electric
$24,021
Gas
$53,936
Water
$21,178
Total Spend
$99,136
Energy Events
Reports/Files



Building ScoreCard

- quartile grades
- utilities
  - electric
  - gas
  - water
- indices include
  - energy
  - spending
  - carbon


Property ScoreCard for Multi Year - Mozilla Firefox
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Fossil Fuel Baseload
Whole Building
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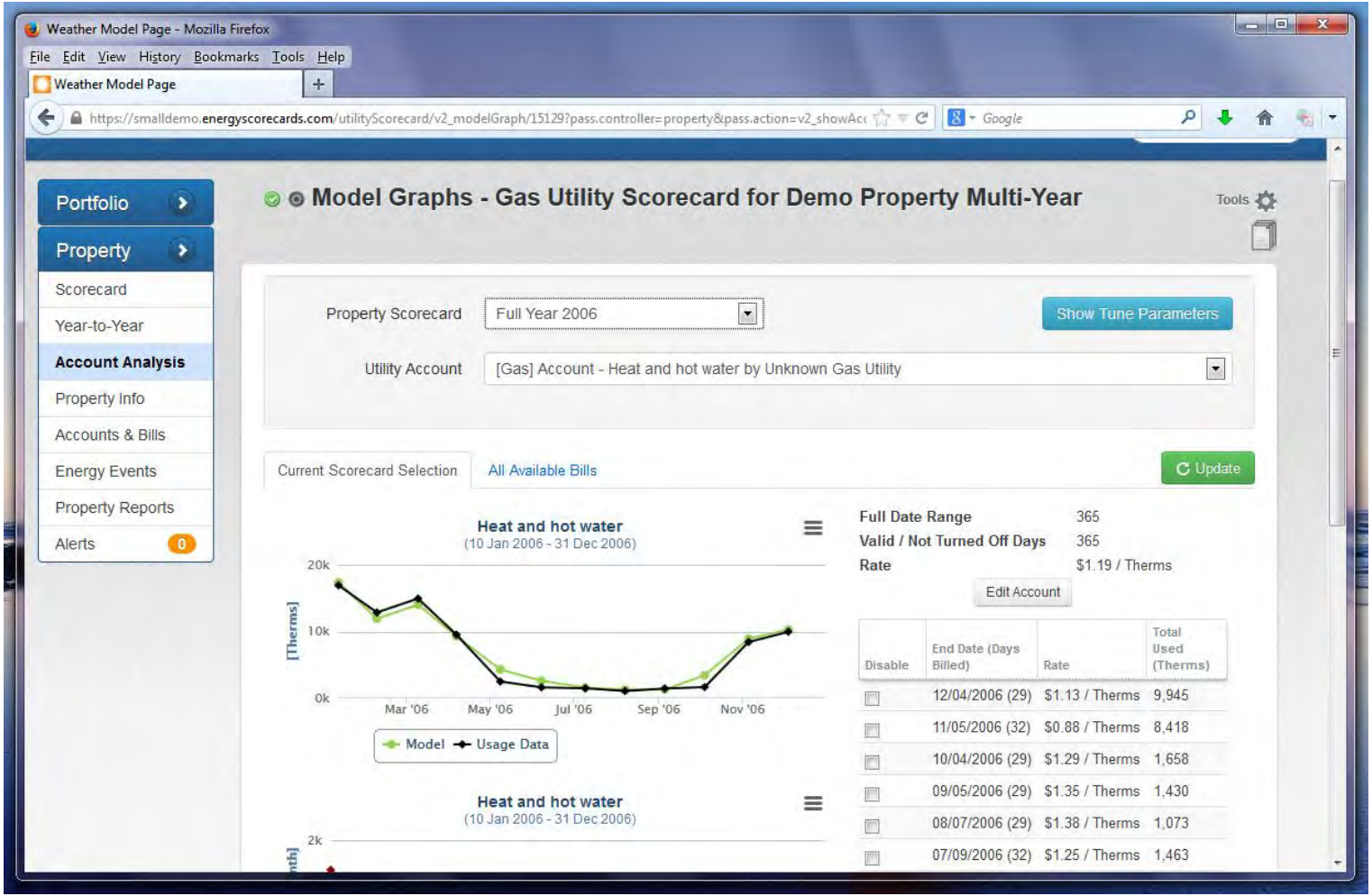
7.4 mmBTU/bdrm/yr
$ 8,560
Water
B
57.3 gal/bdrm/day
$ 21,177
Energy Events
Reports/Files


Weather Model Page - Mozilla Firefox
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Weather Model Page
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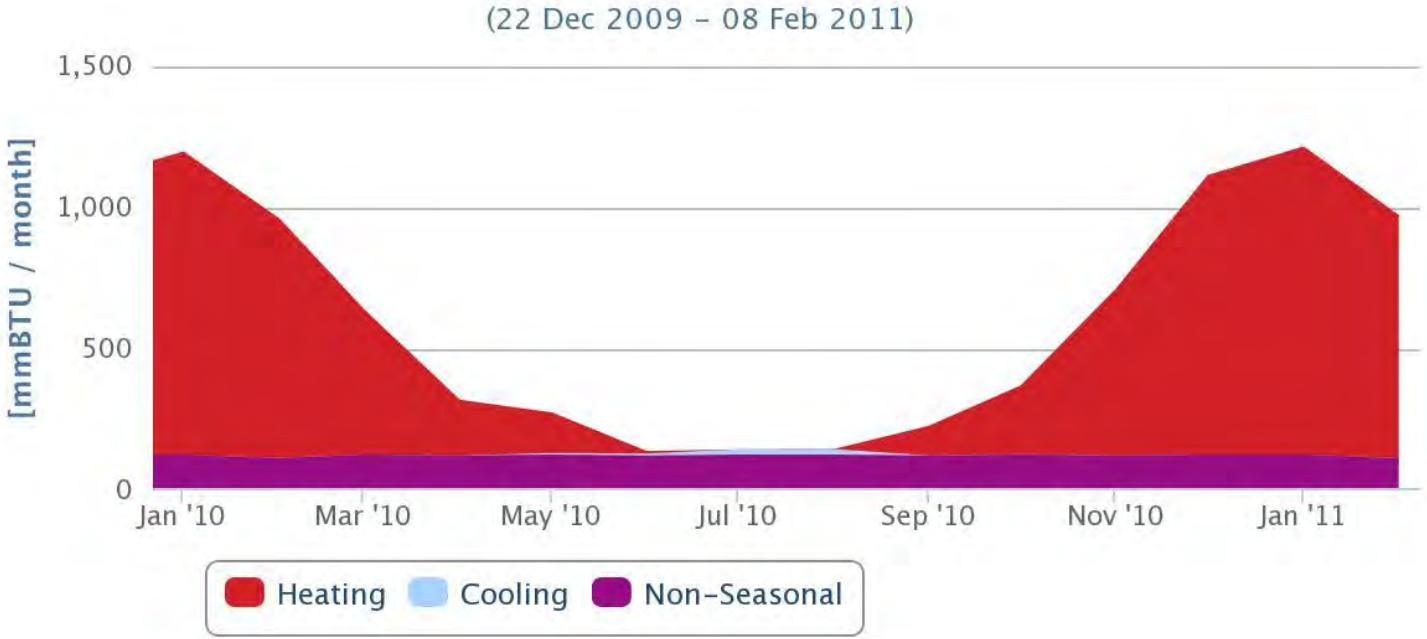
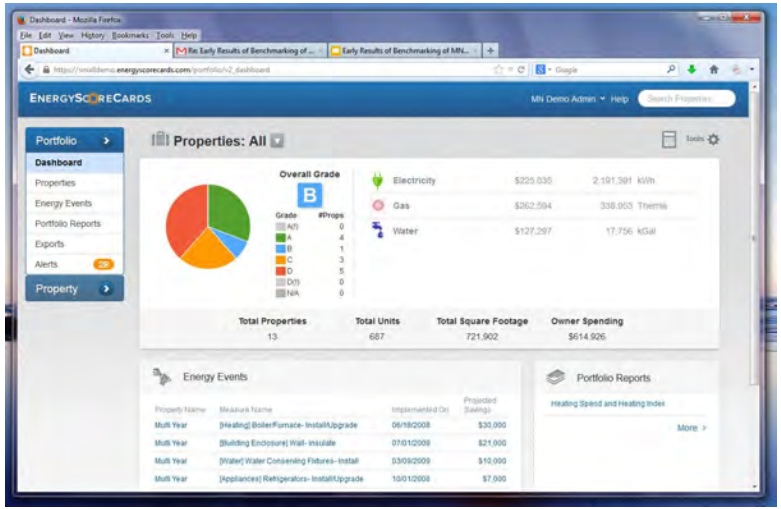
Google
Portfolio
Property
Scorecard
Year-to-Year
Account Analysis
Property Info
Accounts & Bills
Energy Events
Property Reports
Alerts 0
Model Graphs - Gas Utility Scorecard for Demo Property Multi-Year
Tools
Property Scorecard
Full Year 2006
Show Tune Parameters
Utility Account
[Gas] Account - Heat and hot water by Unknown Gas Utility
Current Scorecard Selection
All Available Bills
Update
Heat and hot water
(10 Jan 2006 - 31 Dec 2006)
20k
10k
0k
[Therms]
Mar '06
May '06
Jul '06
Sep '06
Nov '06
Model
Usage Data
Heat and hot water
(10 Jan 2006 - 31 Dec 2006)
2k
Full Date Range 365
Valid / Not Turned Off Days 365
Rate $1.19 / Therms
Edit Account
Disable
End Date (Days Billed)
Rate
Total Used (Therms)
12/04/2006 (29) $1.13 / Therms 9,945
11/05/2006 (32) $0.88 / Therms 8,418
10/04/2006 (29) $1.29 / Therms 1,658
09/05/2006 (29) $1.35 / Therms 1,430
08/07/2006 (29) $1.38 / Therms 1,073
07/09/2006 (32) $1.25 / Therms 1,463

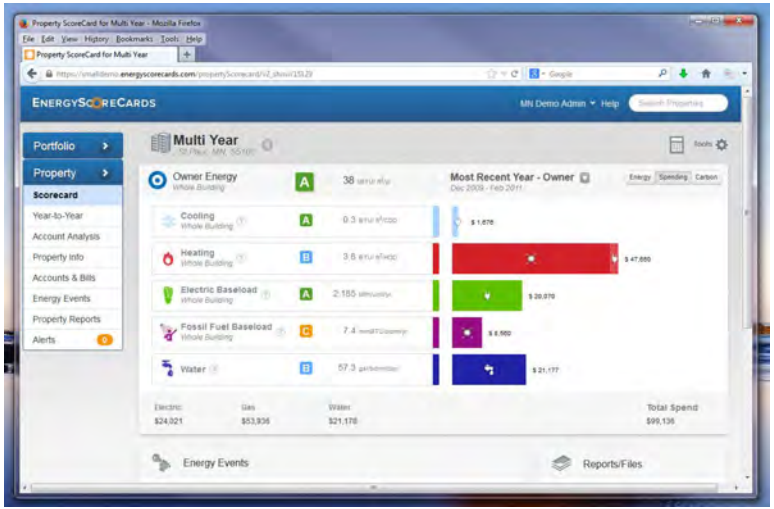
Payment structures - common

- 90 -- Owner pays all utilities – this is the most straightforward
- 407 --properties have owner paying for heat and hot water, tenant pays electric and cooling
- 42 -- properties have only the owner paying for their hot water consumption (in addition to some common area spaces)



weather normalized; base load analysis





EnergyScoreCards - Demonstration/Tour

Multifamily Characterization

- 562 Buildings participating in the program
- Depending on year, data on around 540
- More complete energy consumption than water
- Cost and use breakouts
- Several payment types
- Some difference in fuel type
- Using 2012 data (for the most part)

Payment structures - other

- 11 -- entirely tenant paid, the consumption that we see here only corresponds to the common areas
- 9 -- properties only have the tenant paying for their cooling, the owner paying the remainder including in-unit electric
- 2 -- have the owner paying for everything except heat
- 1 -- property has tenant paid everything except for heat (residents pay for their own hot water)

What does the data show?

Main categories of use:

- Owner pays all
- Owner pays heat and hot water
- Owner pays only hot water
- Water (all buildings with water values)

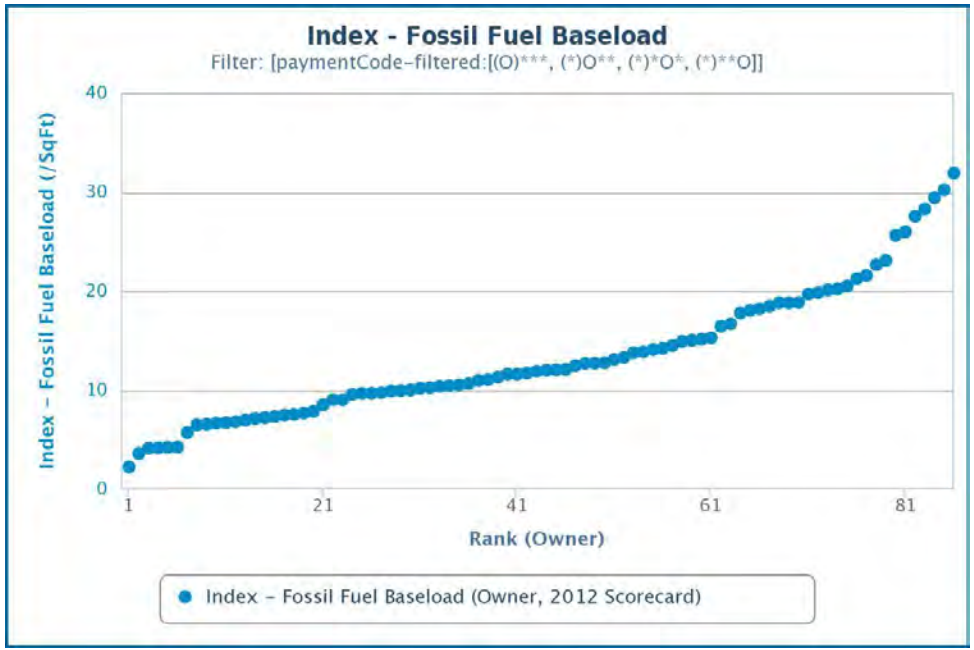
- Year constructed impact
- Impact of garages

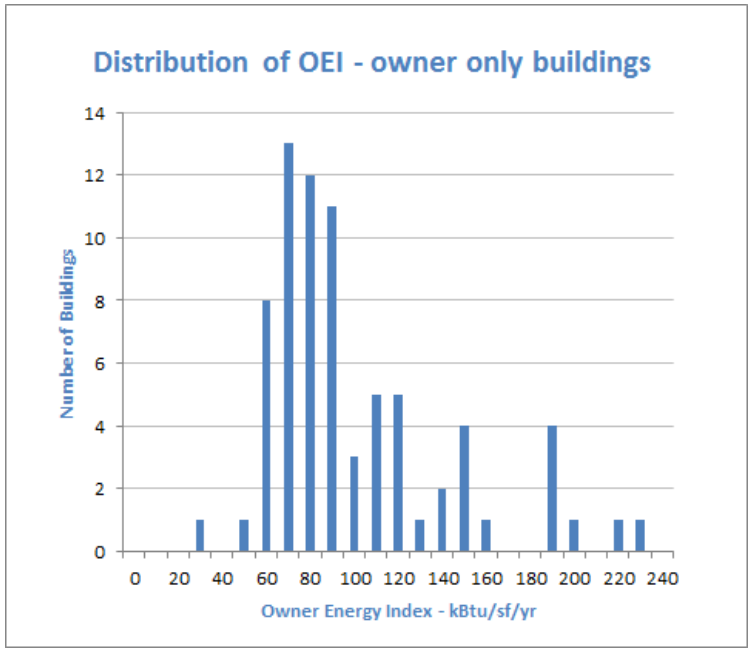
Owner pays all

Range of total energy/sf per year:	29 to 239 kBtu/ft
Cost in $/sf	$0.46 to $3.55
Cost in $/unit:	$377 to $2,313

Owner pays all - distribution

Distribution of Owner Energy Index (OEI - energy owner pays for)





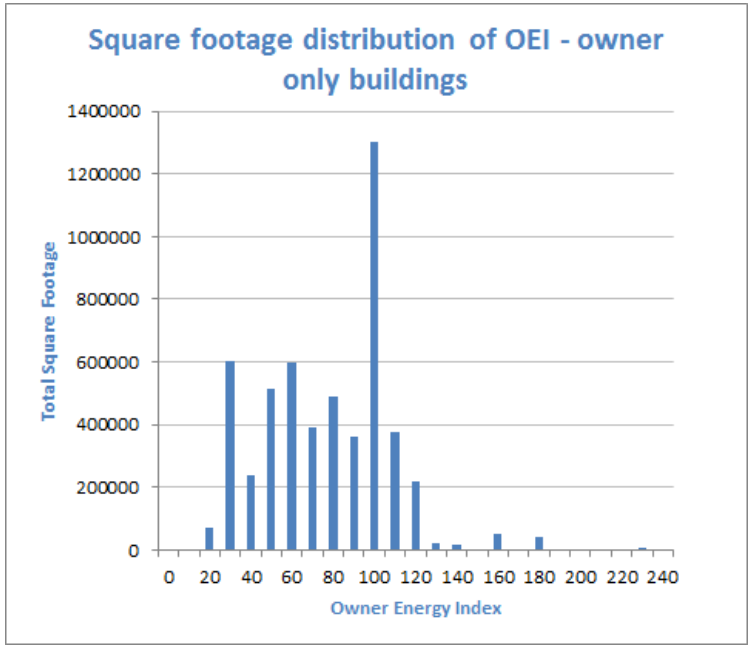
Owner pays all - distribution

Graph shows distribution with areas included (in increments of 10 kBtu/sf)

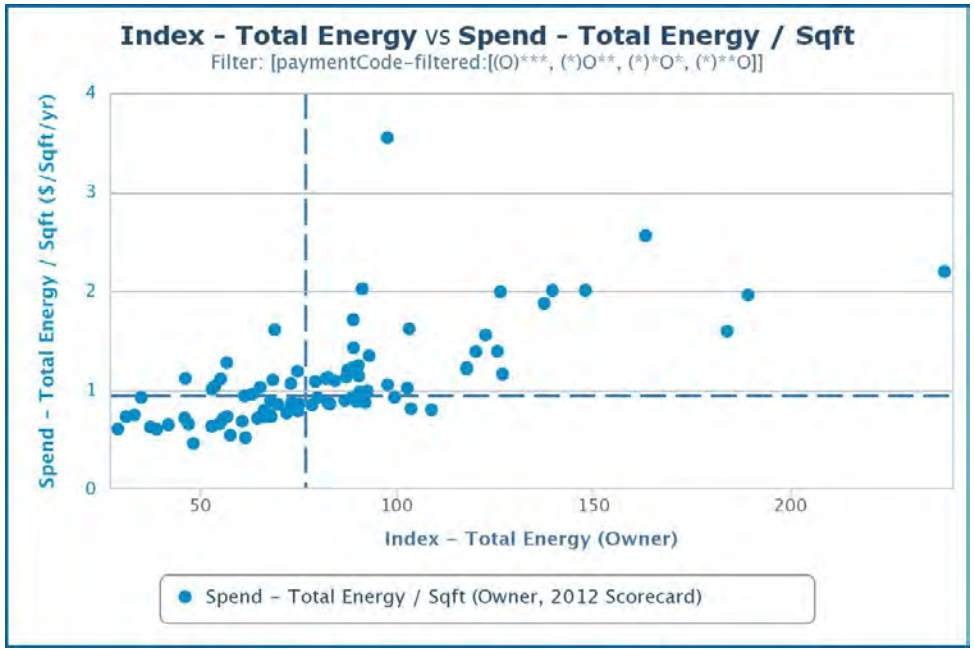
Average: 83.2 kBtu/sf

Median: 76.5 kBtu/sf

Average Weighted By sf: 83.7 kBtu/sf



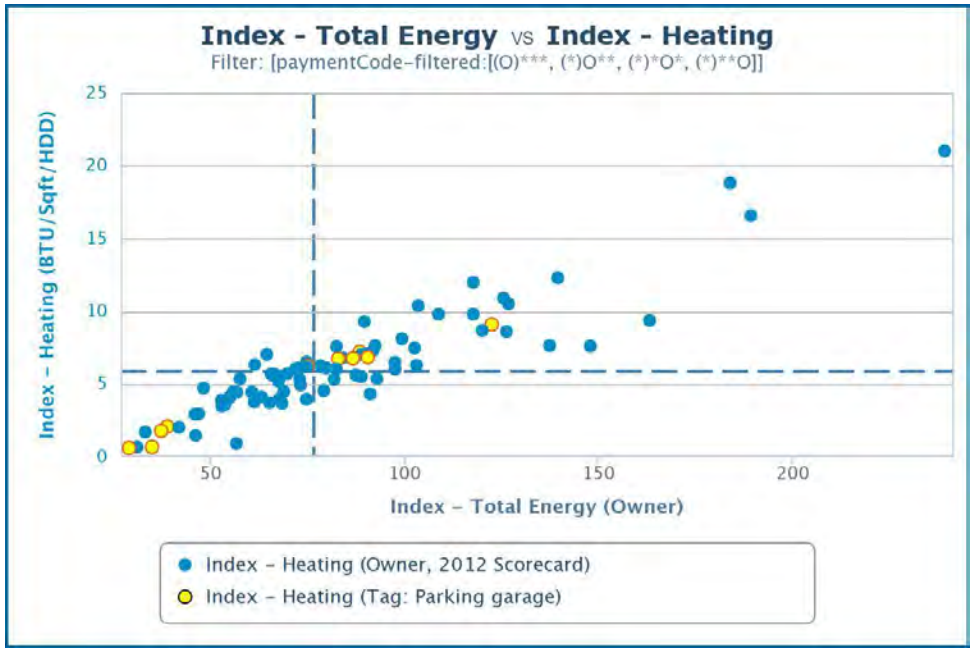
Owner pays all - cost vs energy



As expected, a strong relationship between cost and energy

Around $1 for every 75 kBtu (variability in gas to electric split, utility providers, etc..)

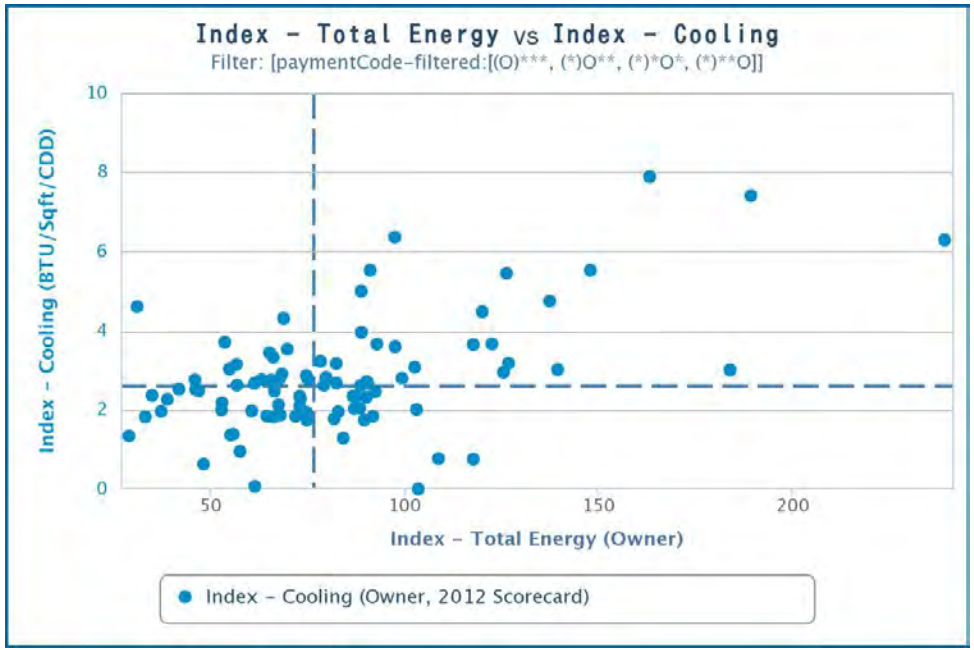
Owner pays all - heating



Heating is clearly the largest contributor to energy use

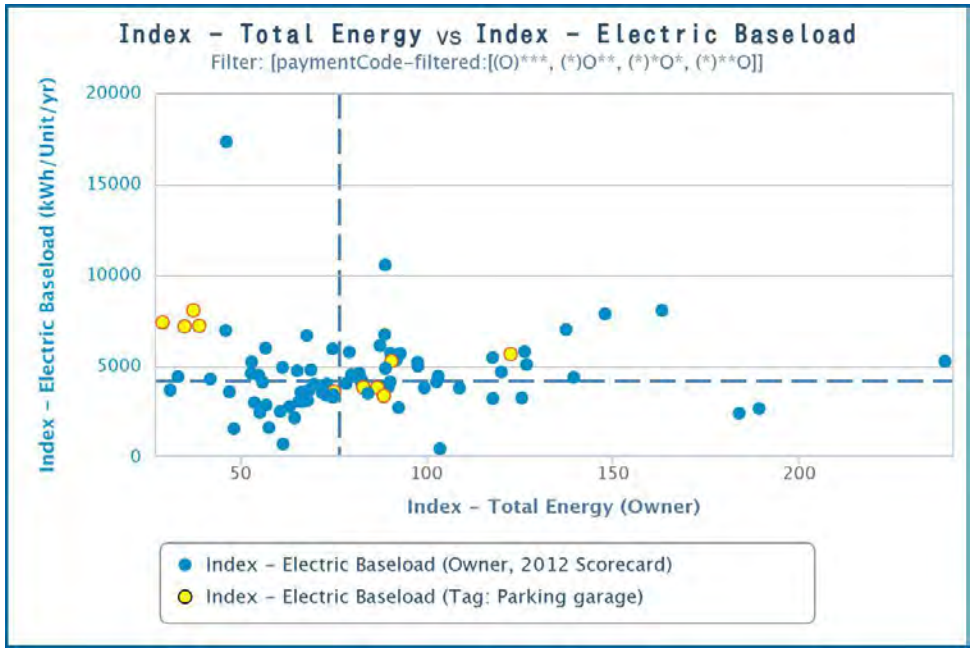
(Properties with parking garages are tagged in yellow)

Owner pays all - cooling



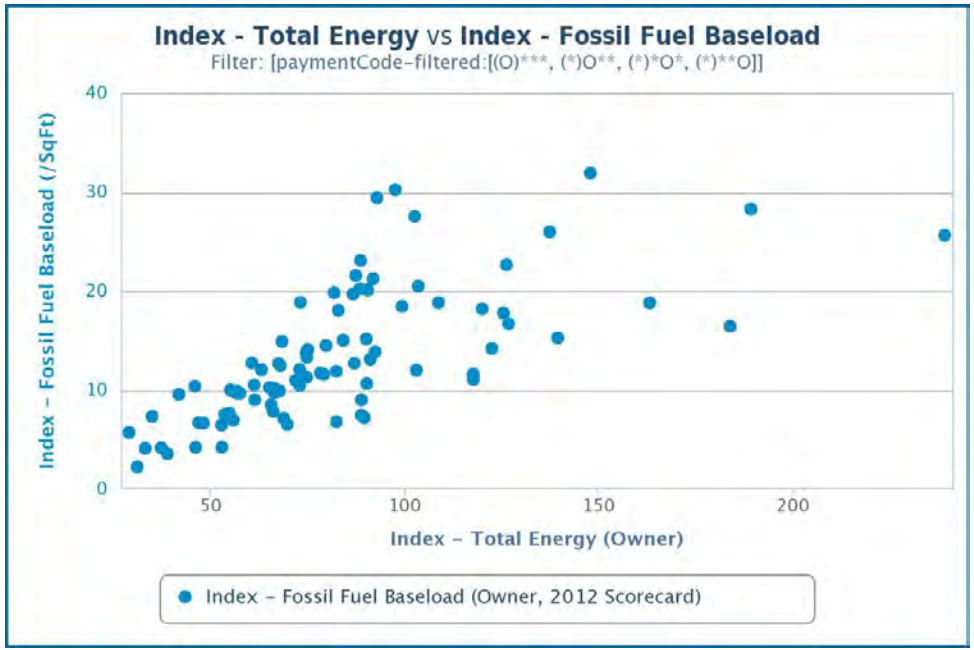
Cooling shows a slightly less strong correlation

Owner pays all - electric baseload



Electric Baseload is a less strong correlation

Owner pays all - fossil fuel baseload



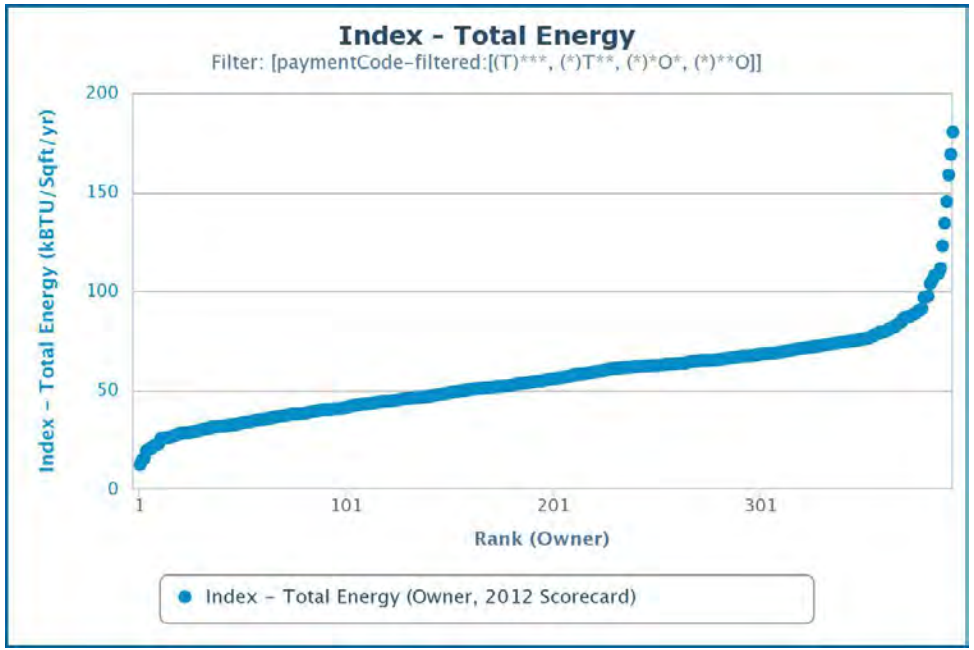
Fossil Fuel Baseload is a clearer correlation than electric baseload

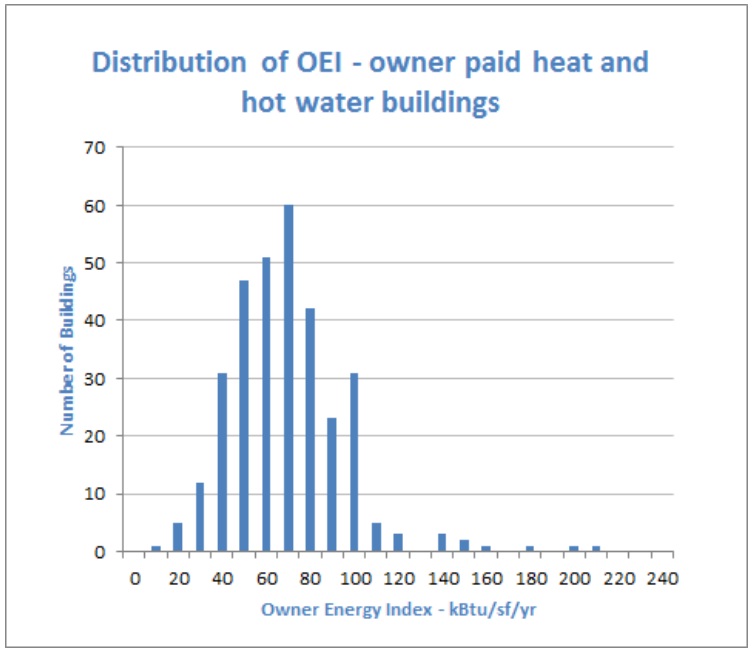
Owner pays heat and hot water

Range of total energy/sf per year:	12 to 180 kBtu/ft
Cost in $/sf	$0.15 to $1.52
Cost in $/unit:	$141 to $1,396

Owner pays heat and hot water- distribution

Distribution of Owner Energy Index (OEI - energy owner pays for)





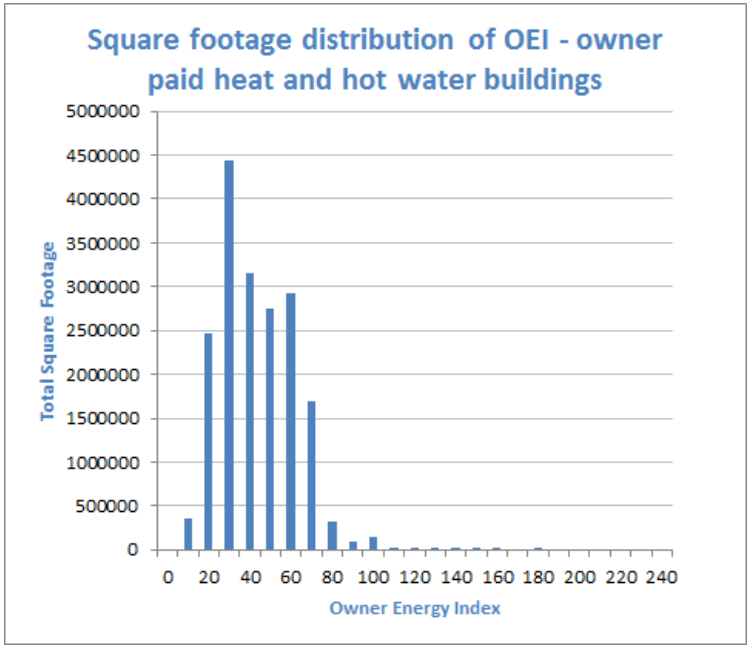
Owner pays heat and hot water - distribution

Graph shows distribution with areas included (in increments of 10 kBtu/sf)

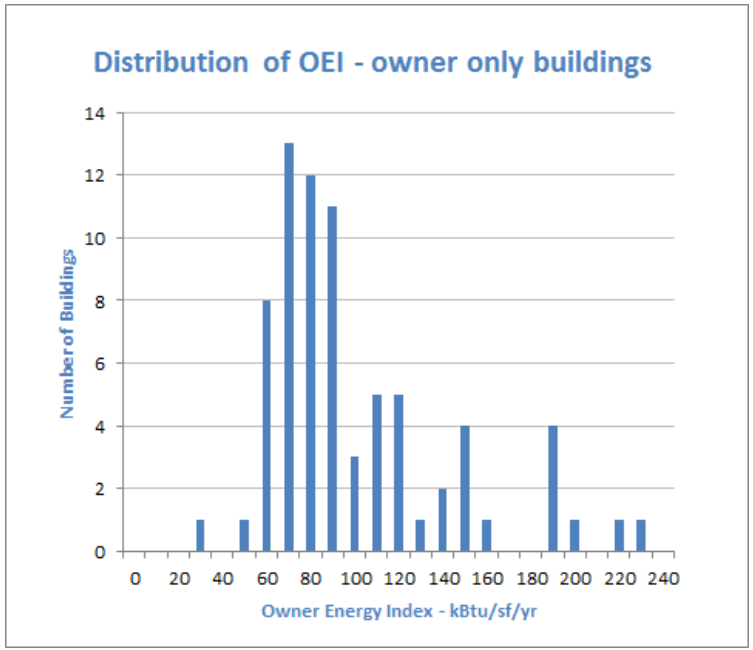
Average: 54.1 kBtu/sf

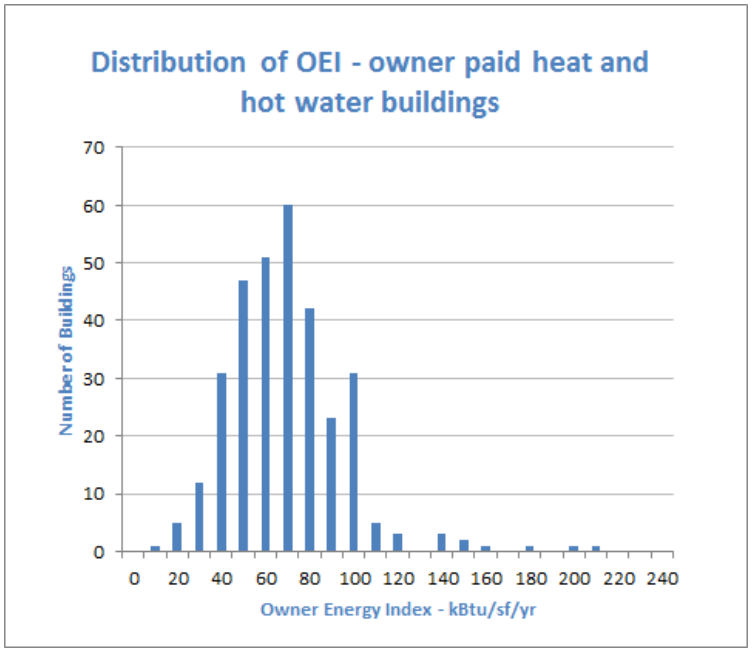
Median: 54.7 kBtu/sf

Average Weighted By sf: 48.2 kBtu/sf

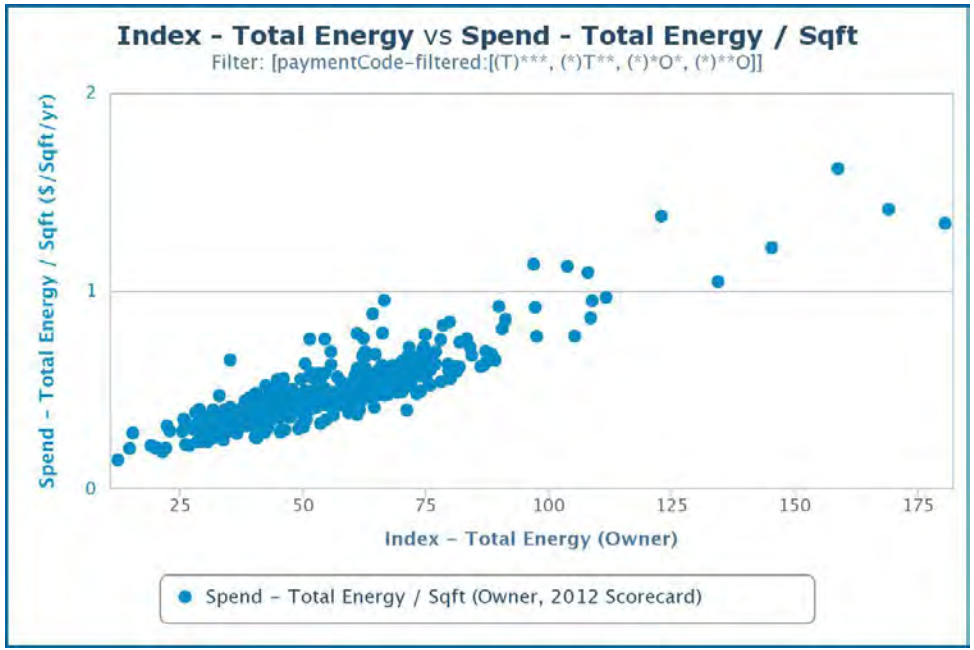


Distribution between owner pays all and owner pays heat and hot water





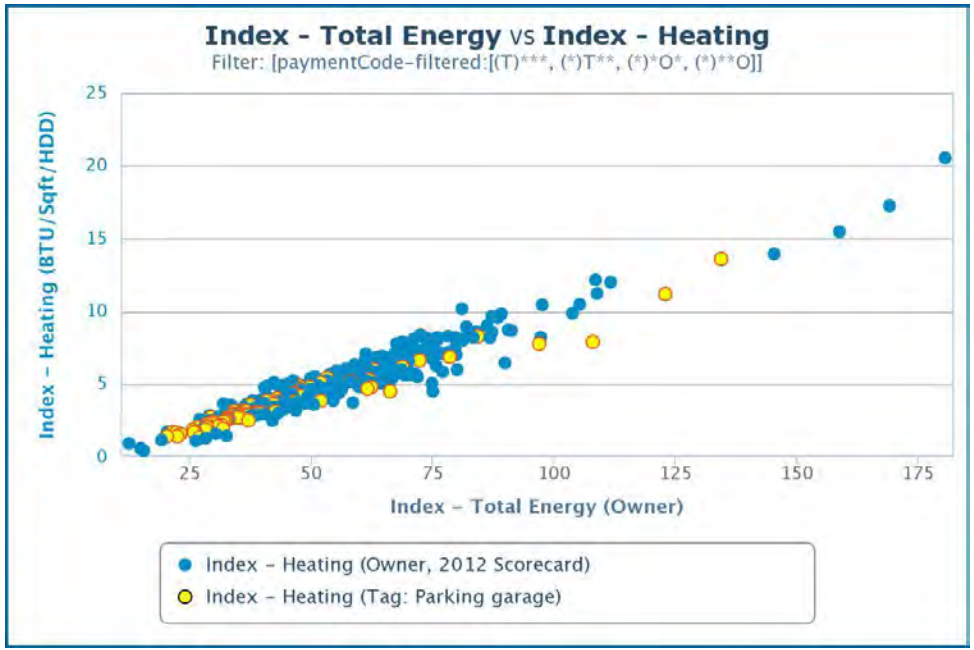
Owner pays heat and hot water - cost vs energy



As expected, a strong relationship between cost and energy

Around $1 for every 100 kBtu (also some variability here)

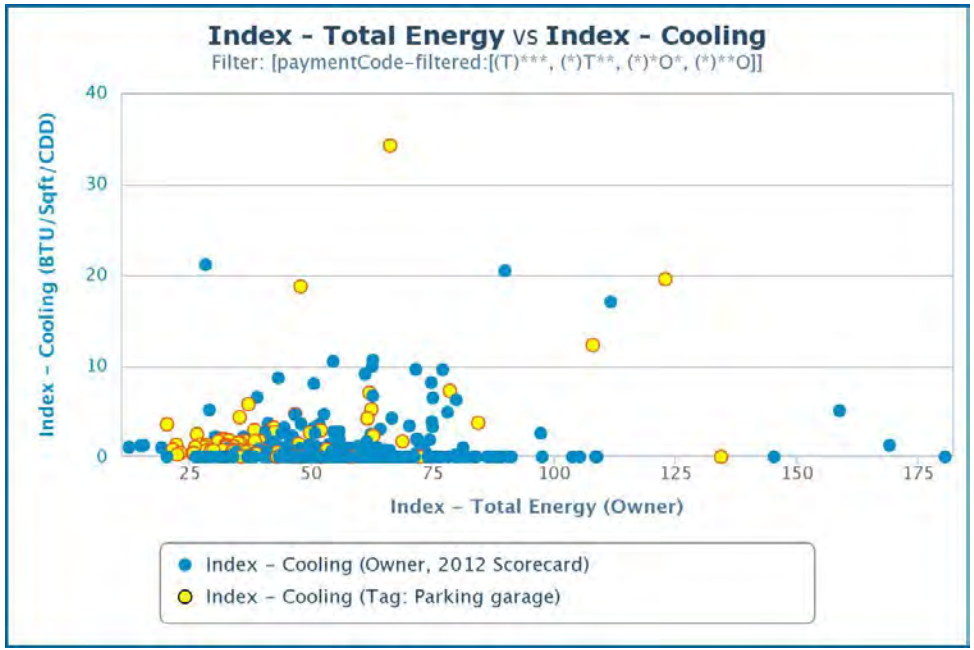
Owner pays heat and hot water - heating



As one would expect, strong correlation

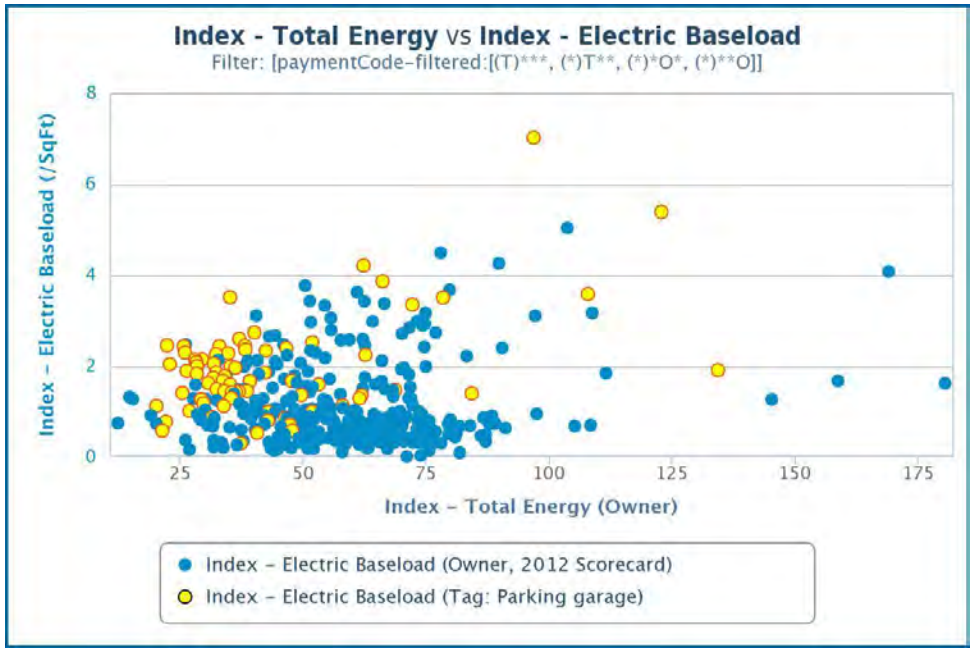
Properties with parking garages are tagged in yellow, cluster in the lower heating and lower owner energy index

Owner pays heat and hot water - cooling



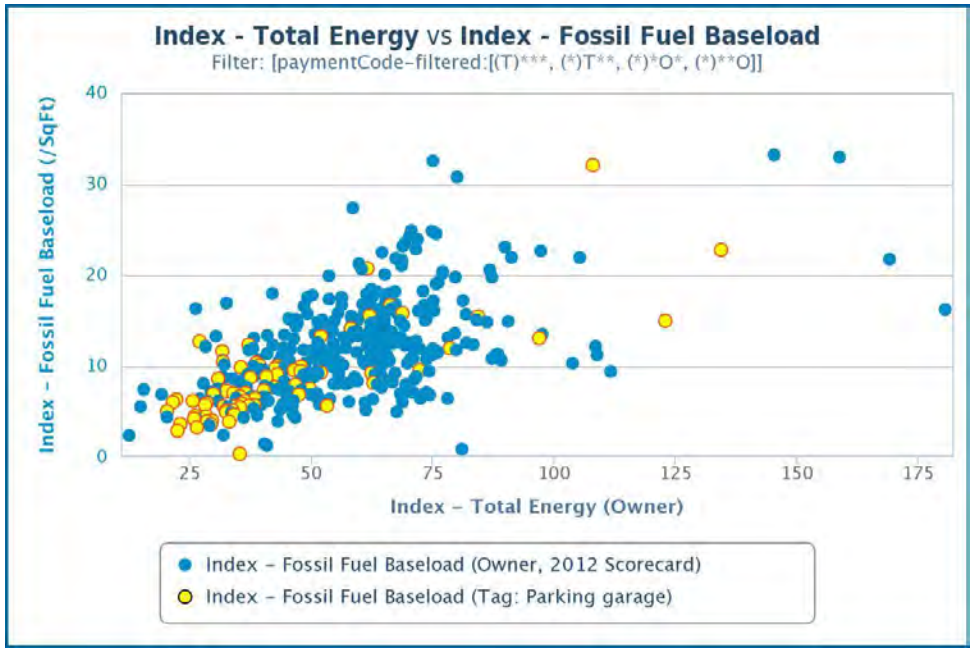
Many showing no cooling consumption

Owner pays heat and hot water- electric baseload



Variable base load, the parking garage tags here start to show a pattern

Owner pays heat and hot water - fossil fuel baseload



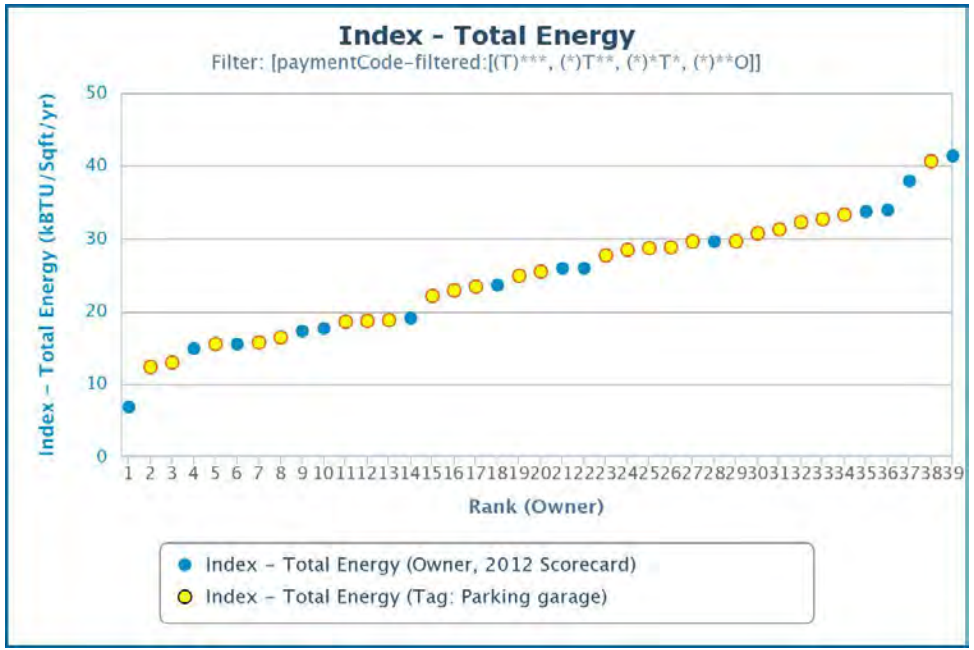
Some clustering, wide variability of fossil fuel baseload

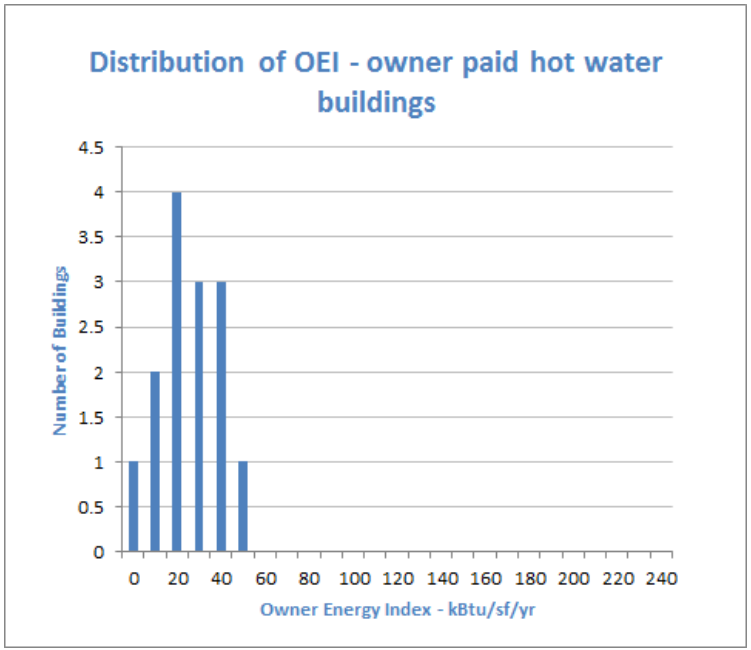
Owner pays only hot water

Range of total energy/sf per year:	6 to 42 kBtu/ft
Cost in $/sf	$0.13 to $0.58
Cost in $/unit:	$103 to $929

Owner pays hot water- distribution

Distribution of Owner Energy Index (energy owner pays for)





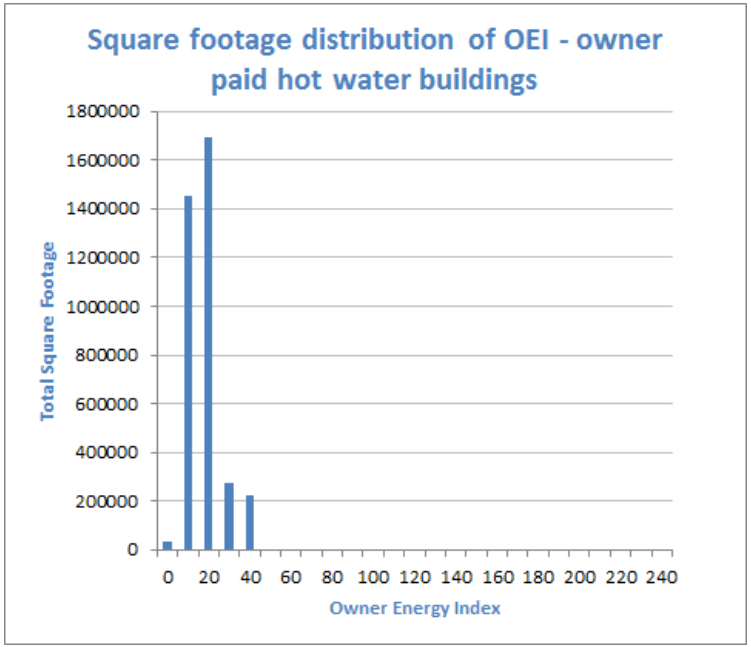
Owner pays hot water - distribution

Graph shows distribution with areas included (in increments of 10 kBtu/sf)

Average: 24.8 kBtu/sf

Median: 23.5 kBtu/sf

Average Weighted By sf: 23.6 kBtu/sf

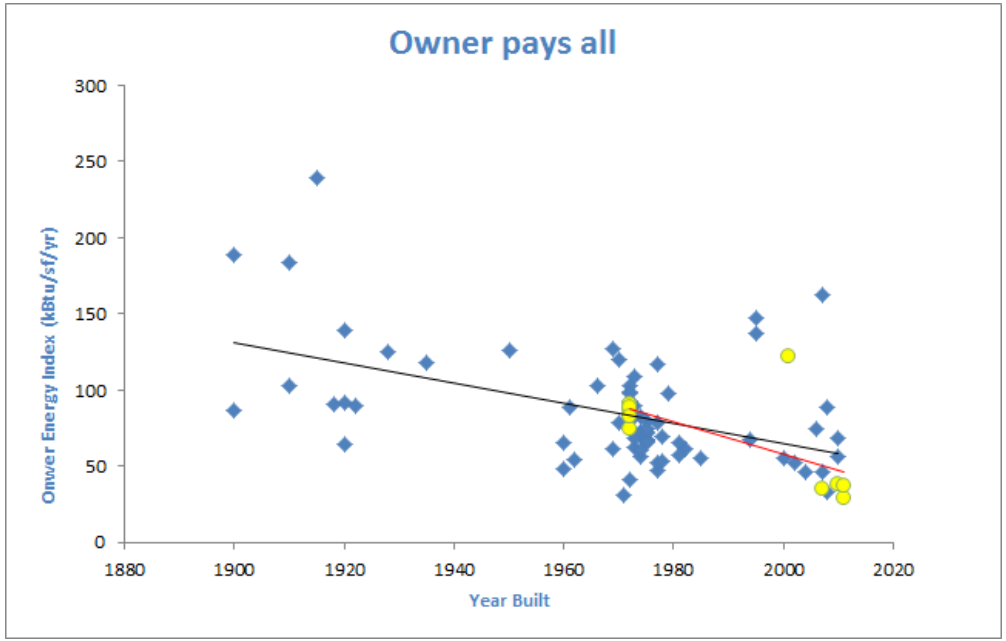


Year built

Some use characteristics change over time

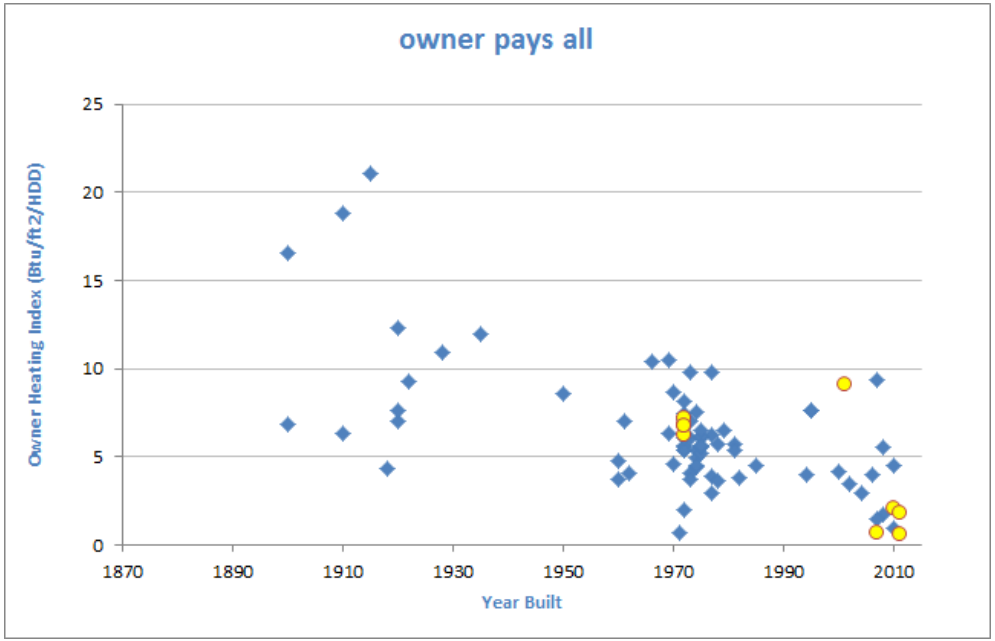
Some have little correspondence with the year of the buildings

Yearly variation - owner pays all



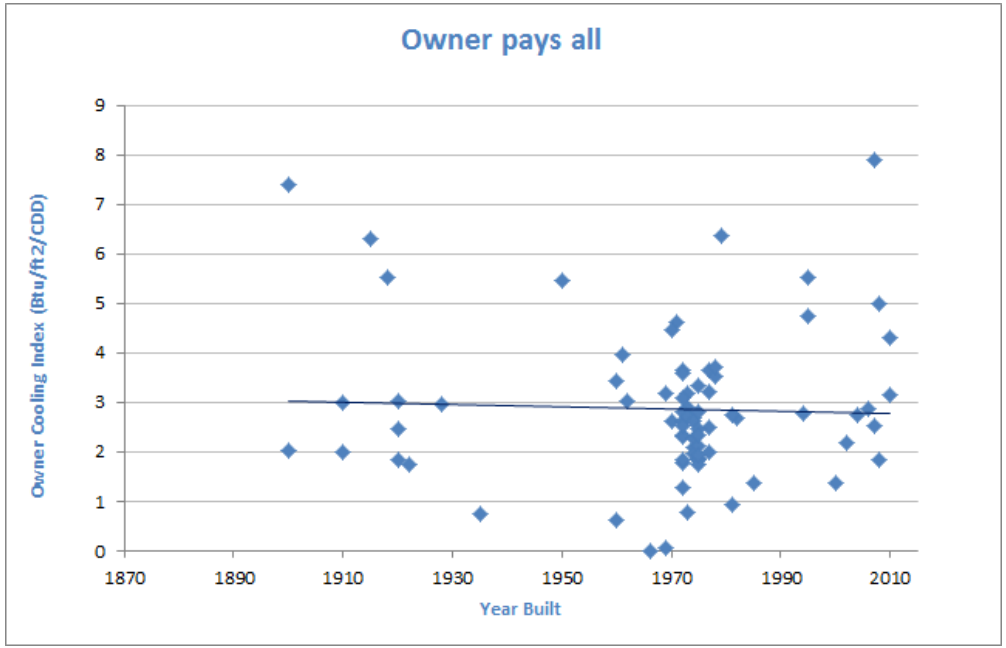
Some improvement in total owner paid energy for more recent projects (some of this comes from larger garage square footage, parking garage buildings are tagged in yellow).

Yearly variation - owner pays all



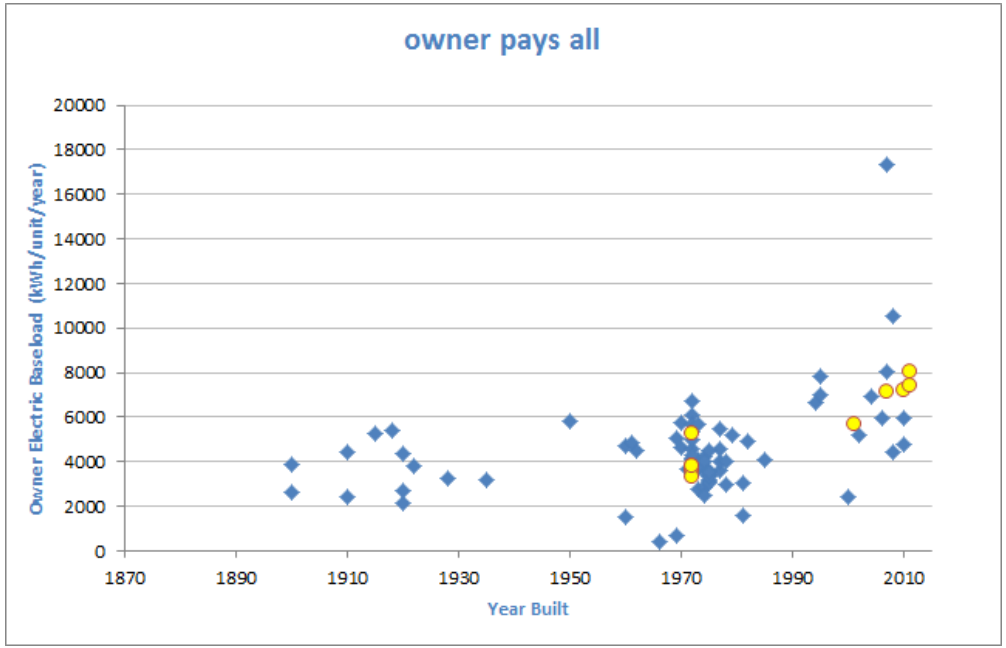
Larger improvement in total owner paid heating for more recent projects - buildings with parking garages are tagged in yellow

Yearly variation - owner pays all



Little apparent pattern in year built to cooling index

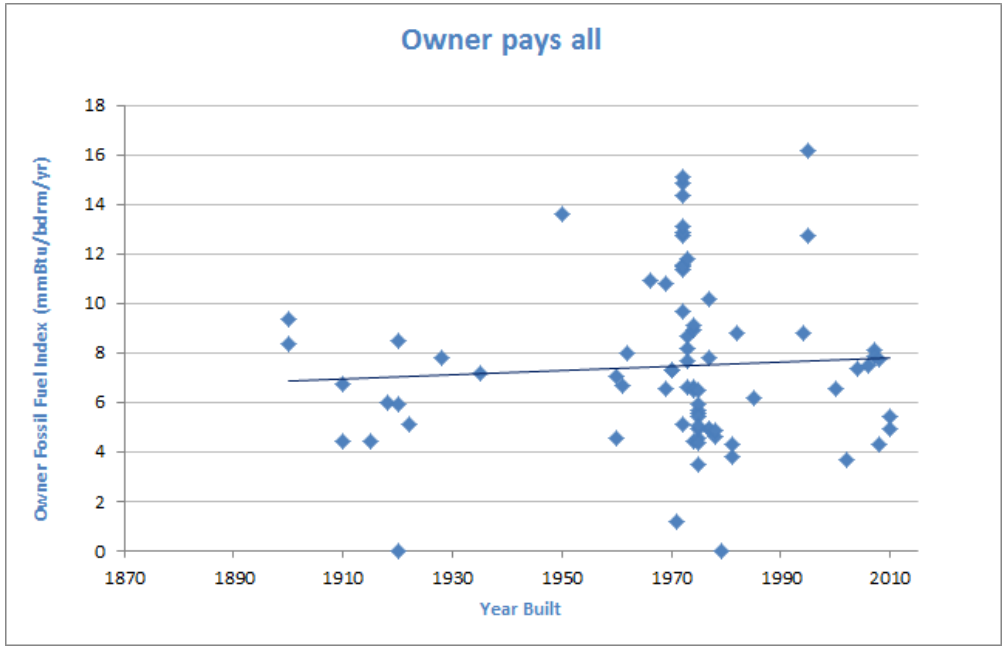
Yearly variation - owner pays all



Some increases in consumption for non-cooling electrical use - includes tenant consumptions

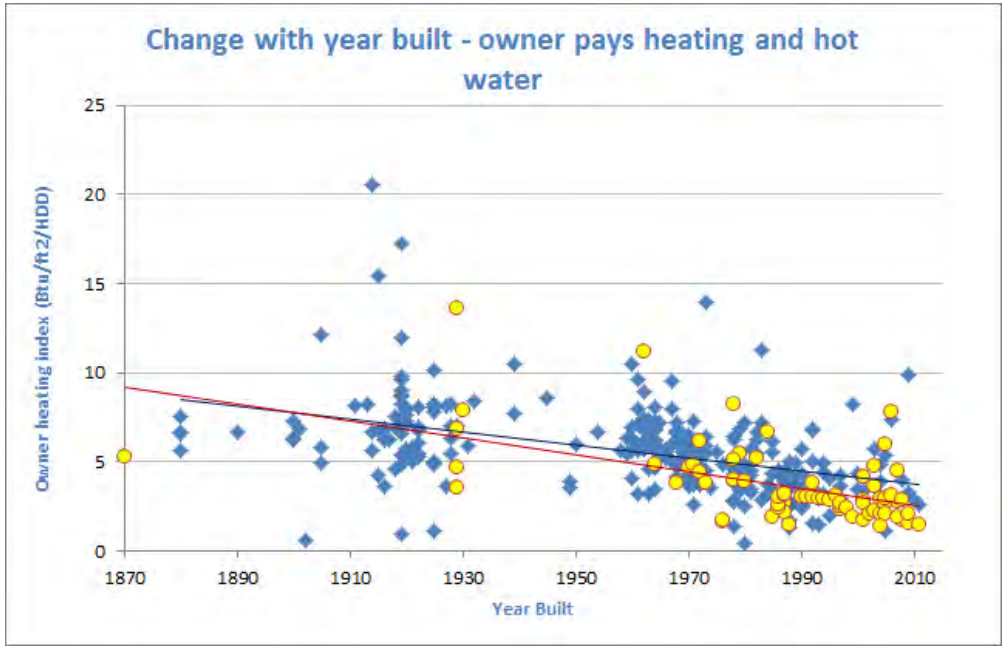
buildings with parking garages tagged yellow

Yearly variation - owner pays all



Also little apparent variation to fossil fuel index

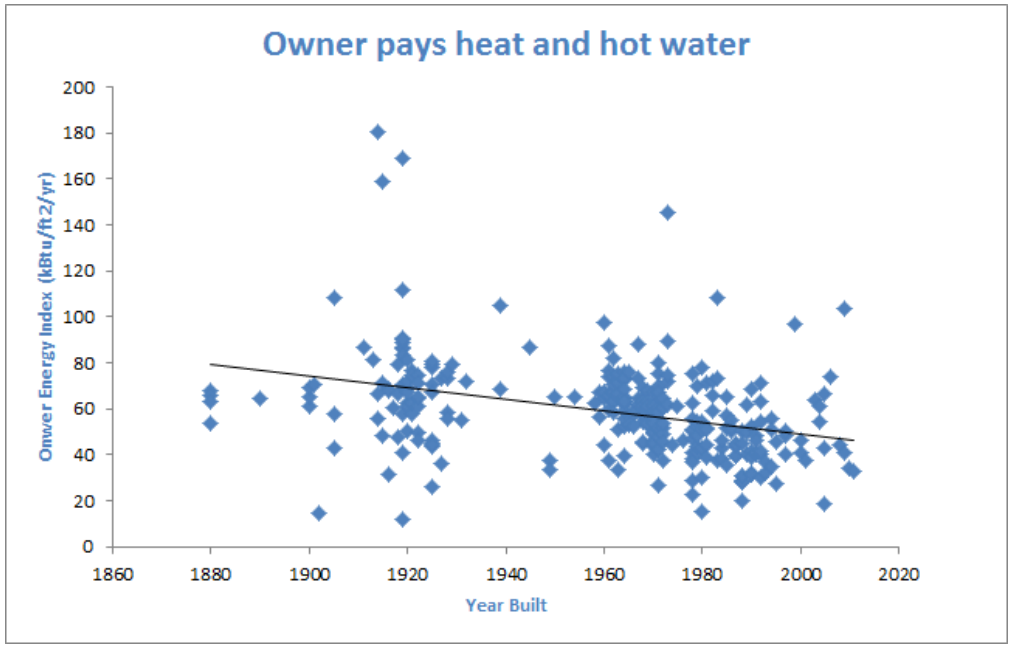
Variation by year built- owner pays heat and hot water



Strongest relationship in heating

parking garage properties tagged in yellow

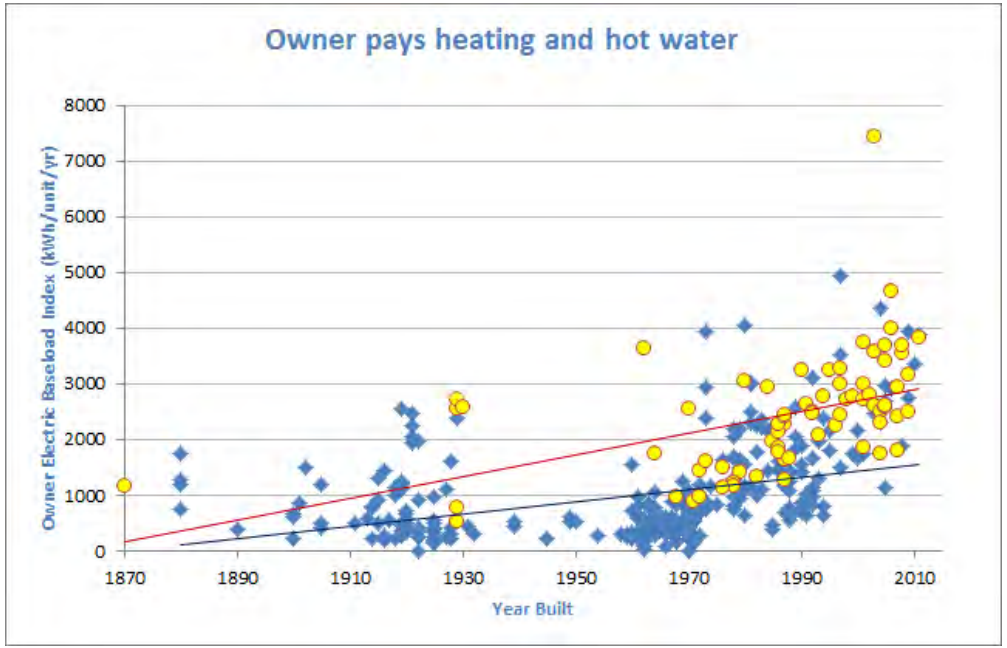
Variation by year built- owner pays heat and hot water



We can split out the owner pays heat and hot water with no garages and look at the owner energy index (all the utilities paid by the owner).

Though strong statistical correlation that more recently built buildings use less energy, this accounts for only ~13% of observed variation.

Yearly variation - owner pays heat and hot water



Increase in electric baseload consumption

parking garage properties tagged in yellow

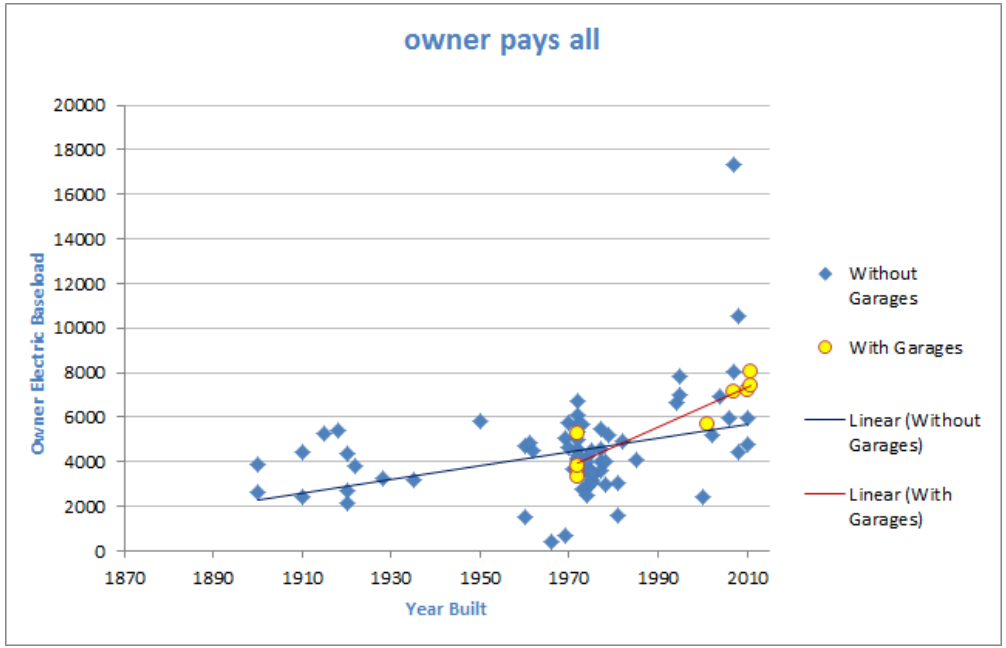
Garages

Several difficulties - splitting out the garage space from the other multifamily space

Level of heating/conditioning of garages varies dramatically

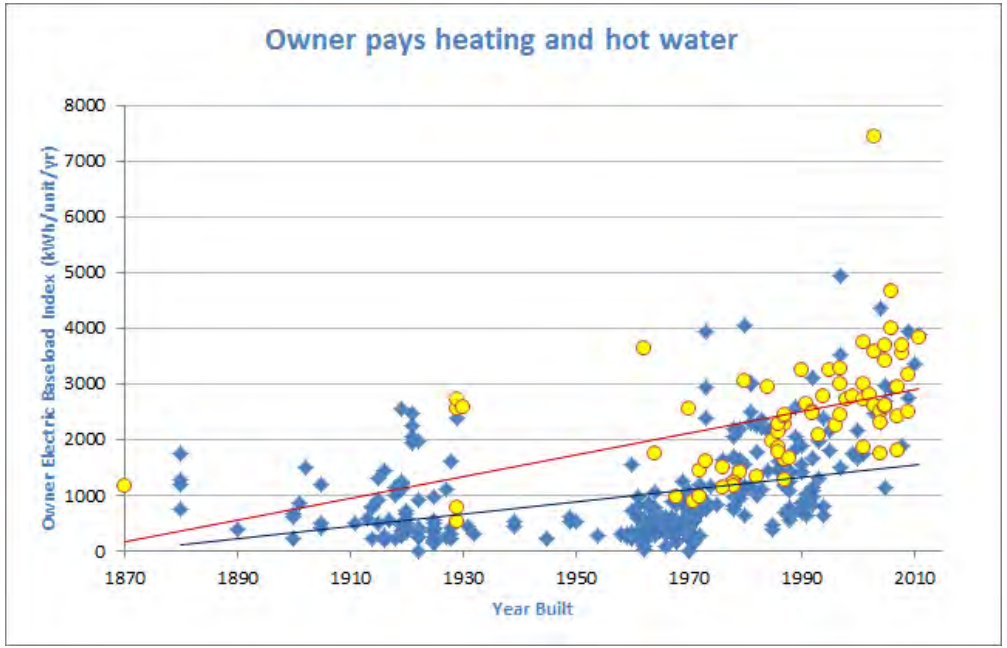
Most projects with garages were built more recently (and more recent projects are generally otherwise more efficient)

Impact of garages - owner pays all



Increase in electric baseload is the primary visible effect (others may get lost in the variability of other factors)

Impact of garages - owner pays heat and hot water



Increase in electric baseload is higher for projects with garage space

Water

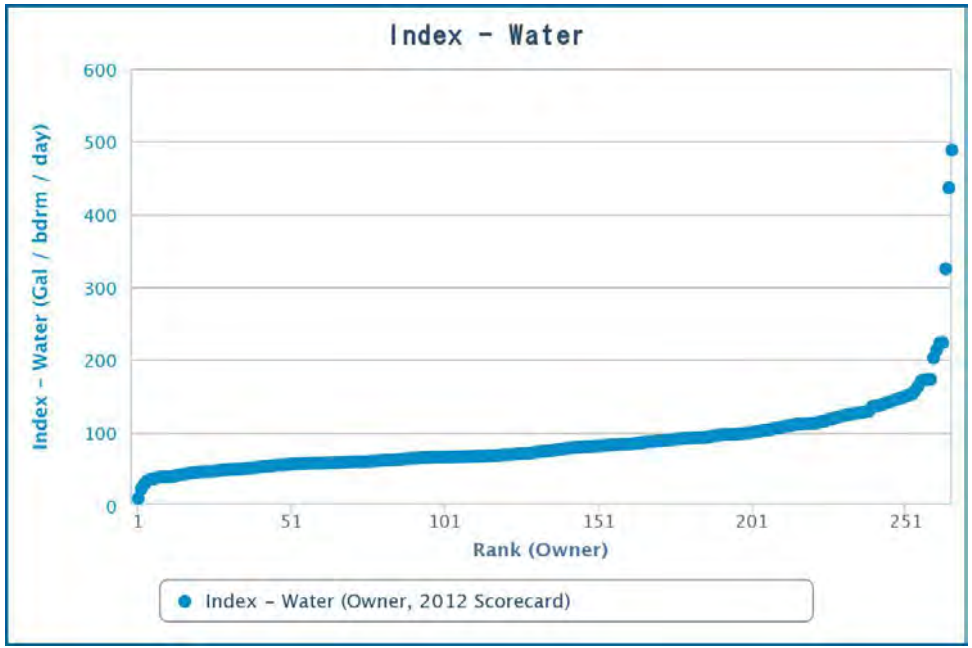
- What is the best metric for water?
  - gallon or $ per sf
  - gallon or $ per occupant
  - gallon or $ per bedroom
  - gallon or $ per unit
- We will look at
  - gallon per bedroom
  - $ per unit
- For our participants, water is typically entirely paid by owner; so this includes all properties with owner paid water
- 266 properties with water data

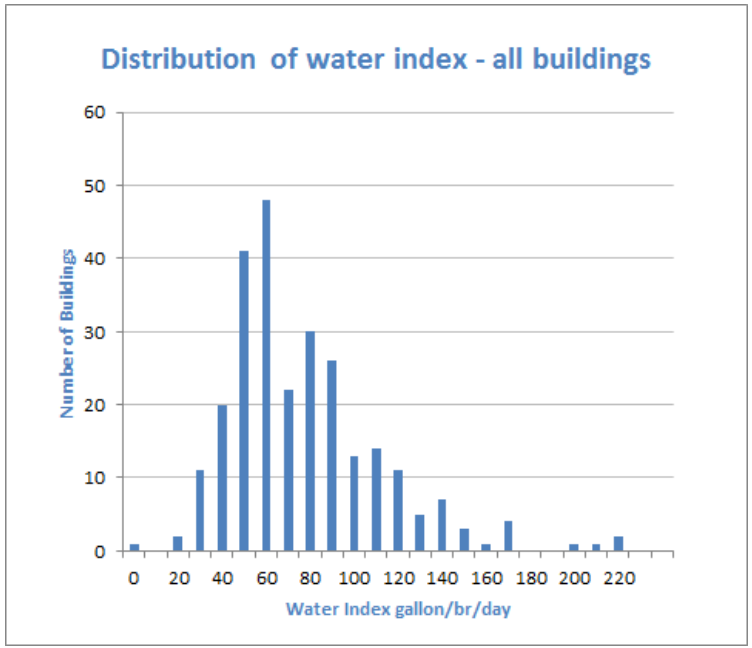
Water

Range of total water/br/day:	10 to 496 gal/br/day
Annual water cost in $/br:	$23 to $1,206
Annual water cost in $/unit:	$29 to $2,413

Water use - distribution

Water use varies considerably





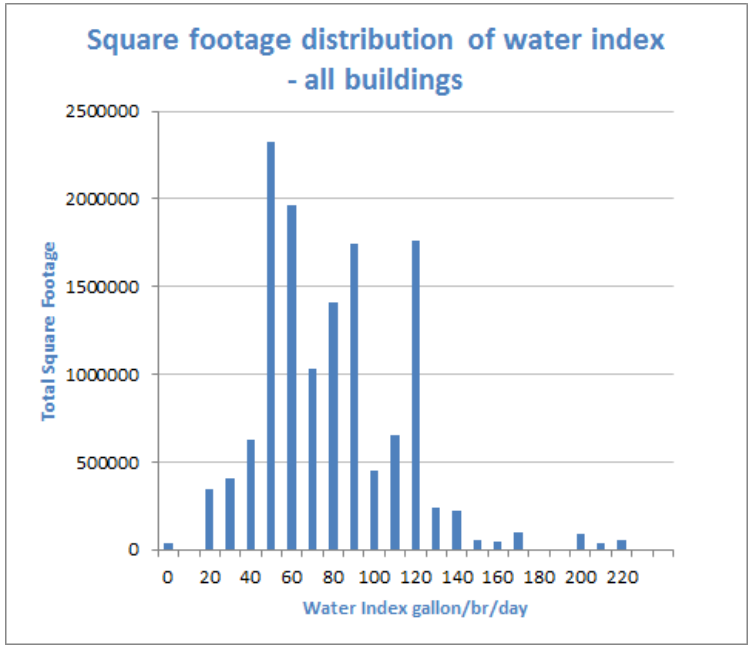
Water use - distribution

Graph shows distribution with areas included (in increments of 10 gal/br/day)

Average: 74.0 gal/br/yr

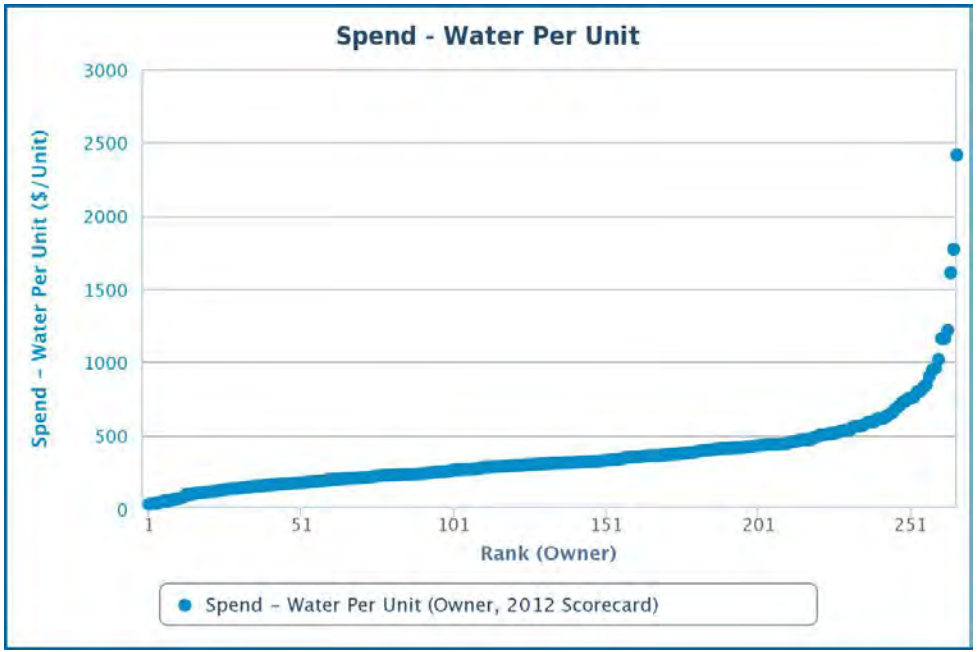
Median: 86.4 gal/br/yr

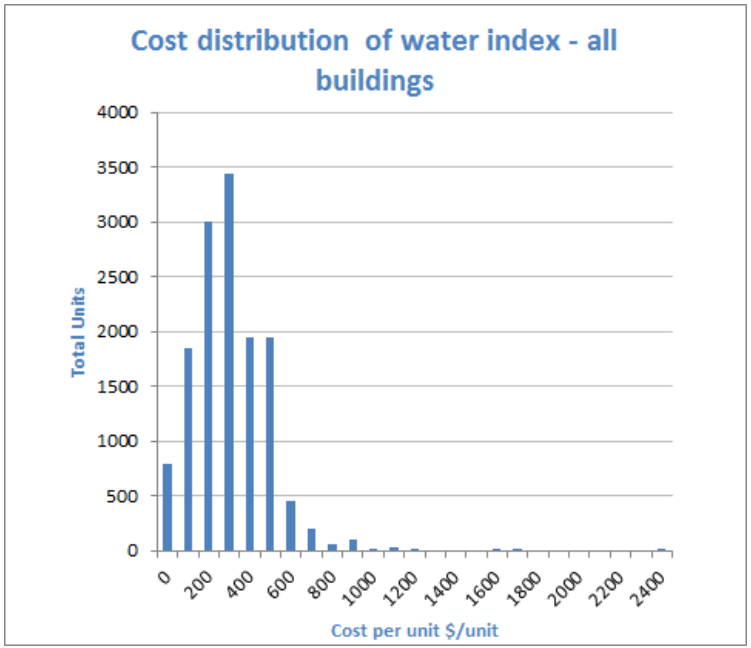
Average Weighted By br: 89.6 gal/br/yr



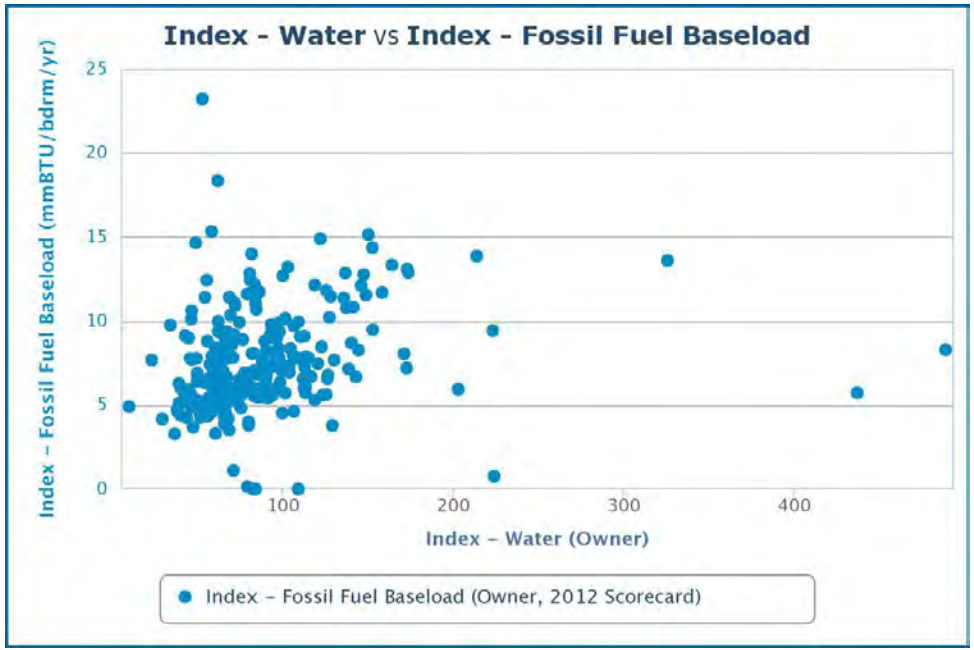
Water spend per unit

Water cost per unit also varies considerably, $29 to $2,413





Fossil Fuel baseload to water use

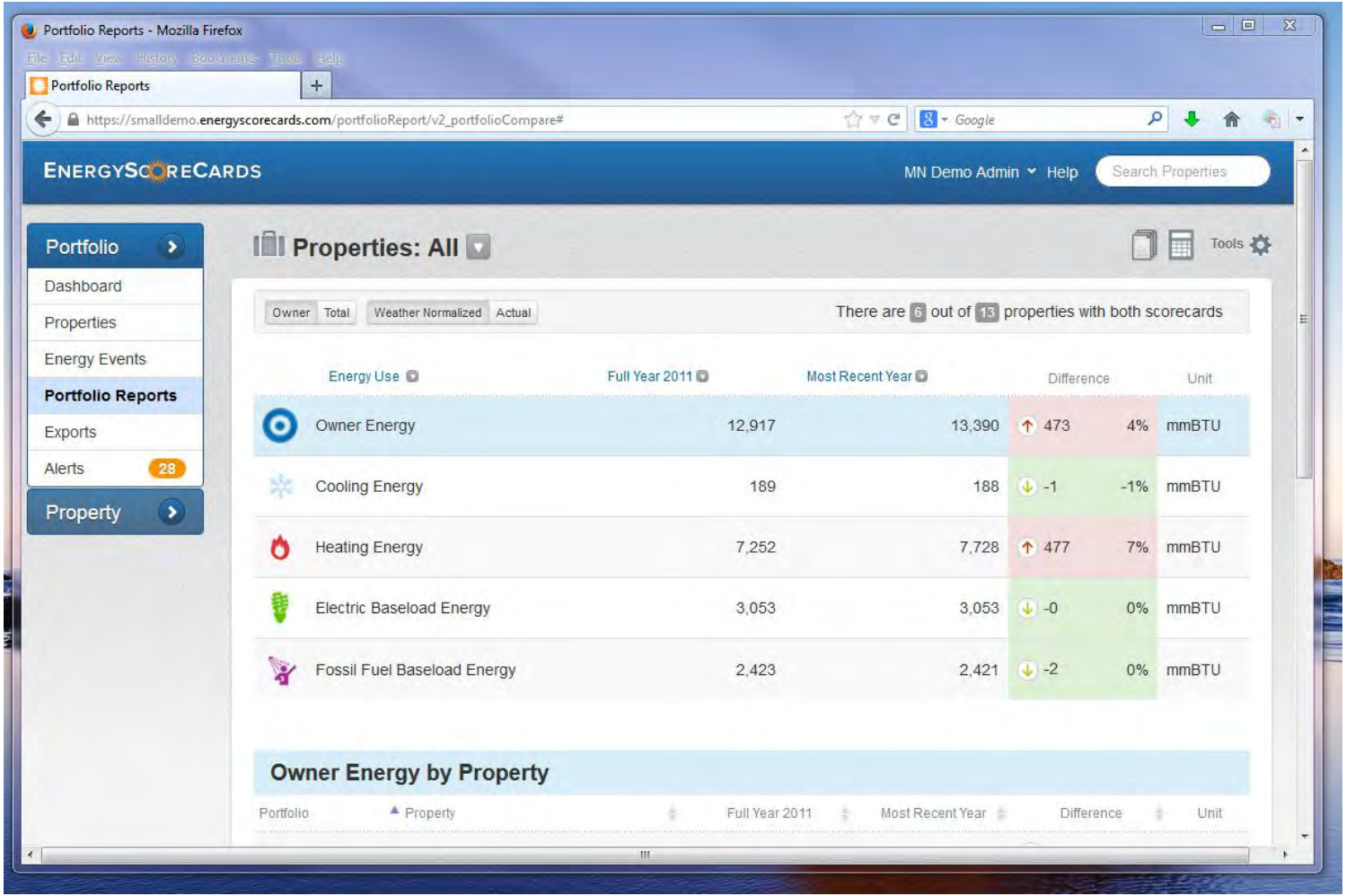


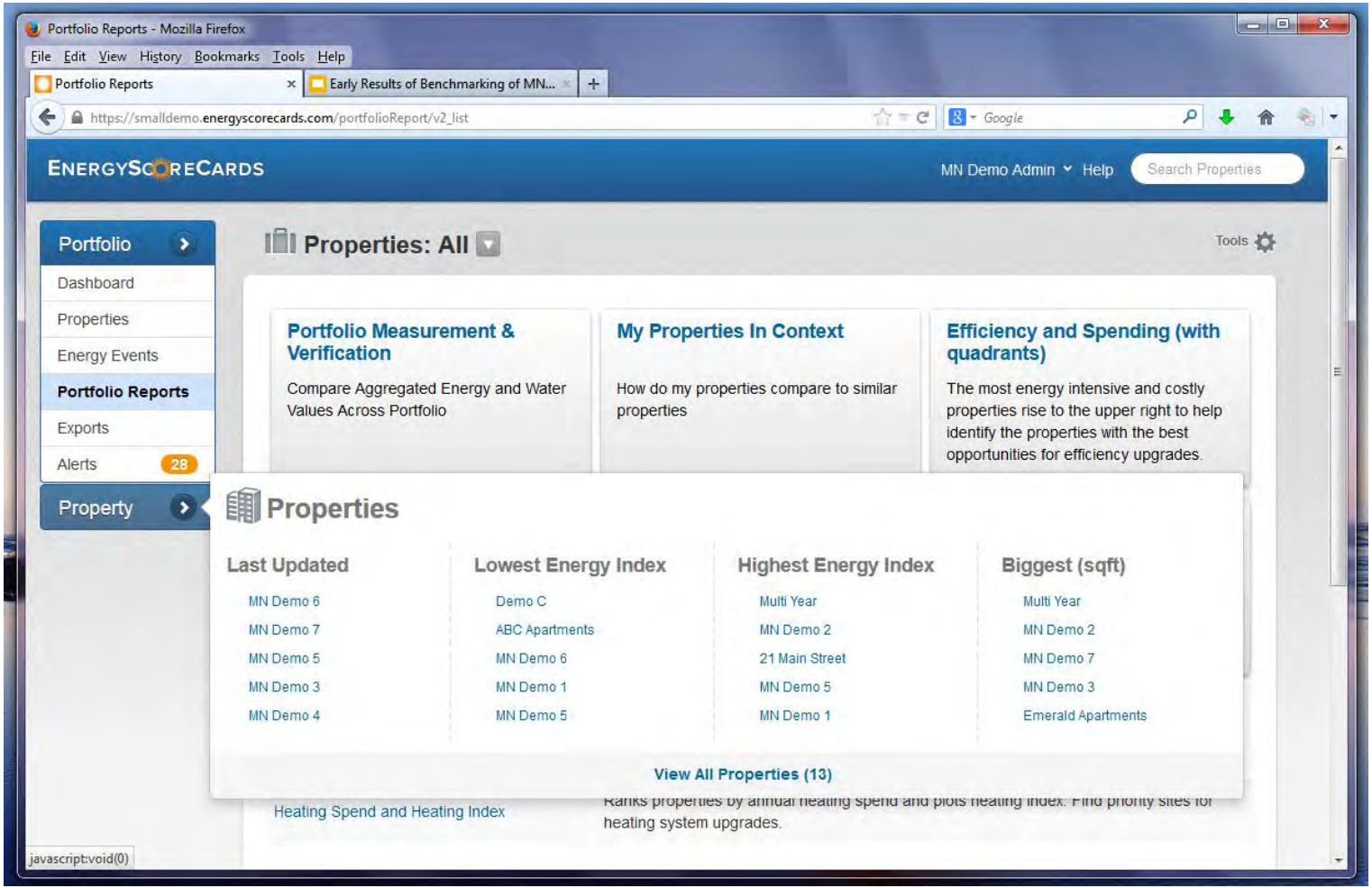
Some connection between fossil fuel baseload and water use

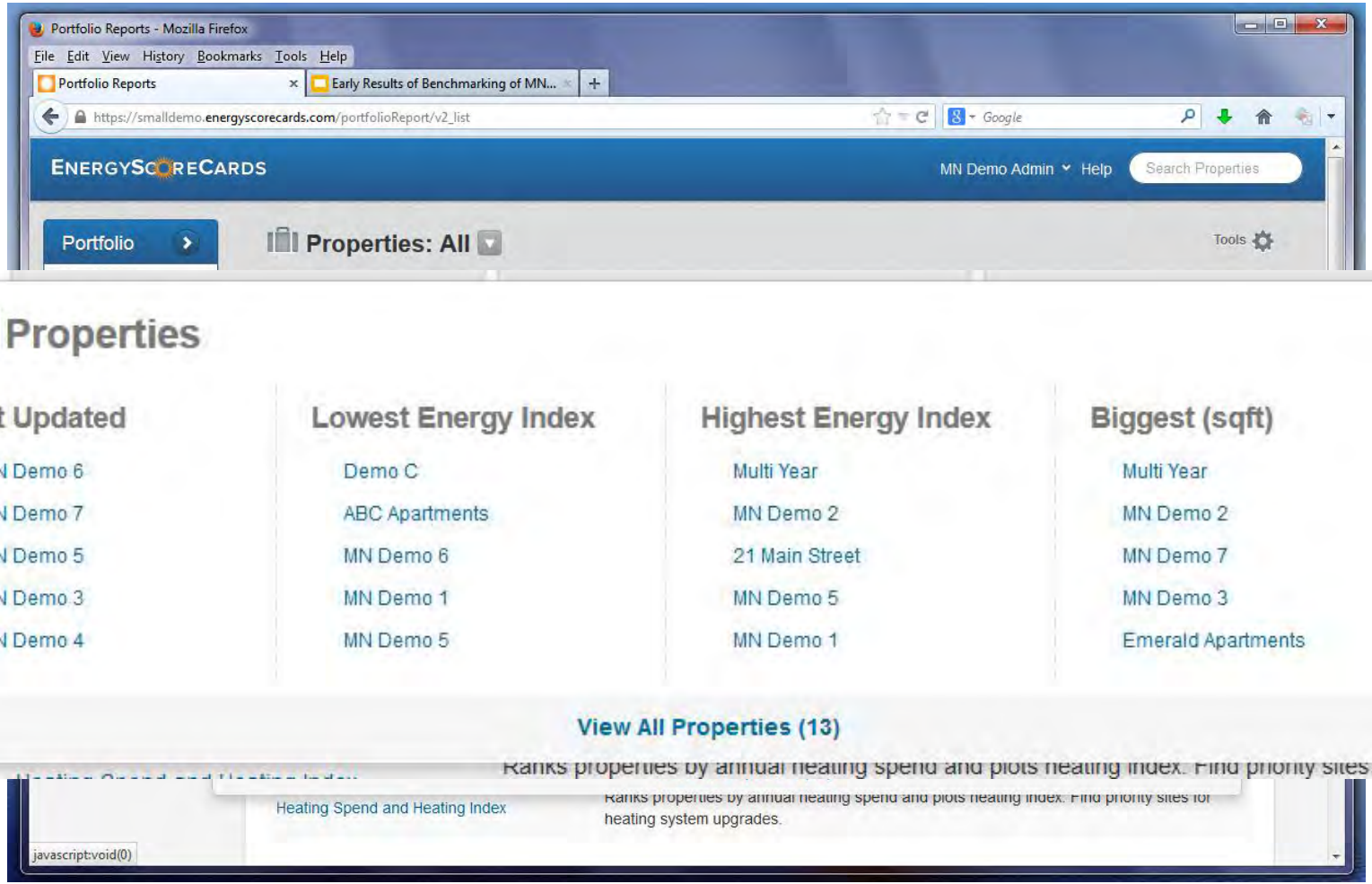
Working with EnergyScoreCards

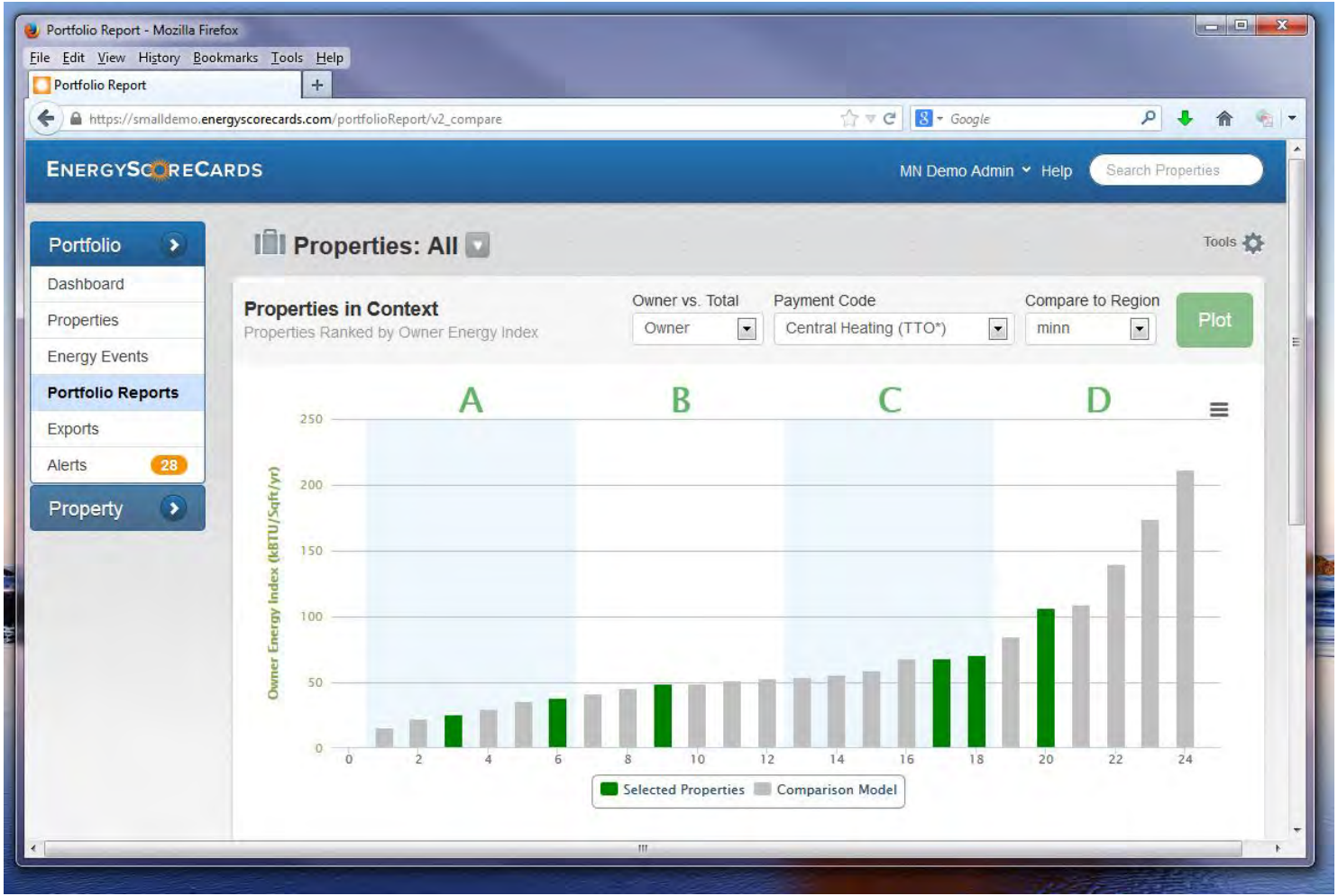
Energy Benchmarking is the process of comparing one residential building energy use to a larger group or industry standard. Why?

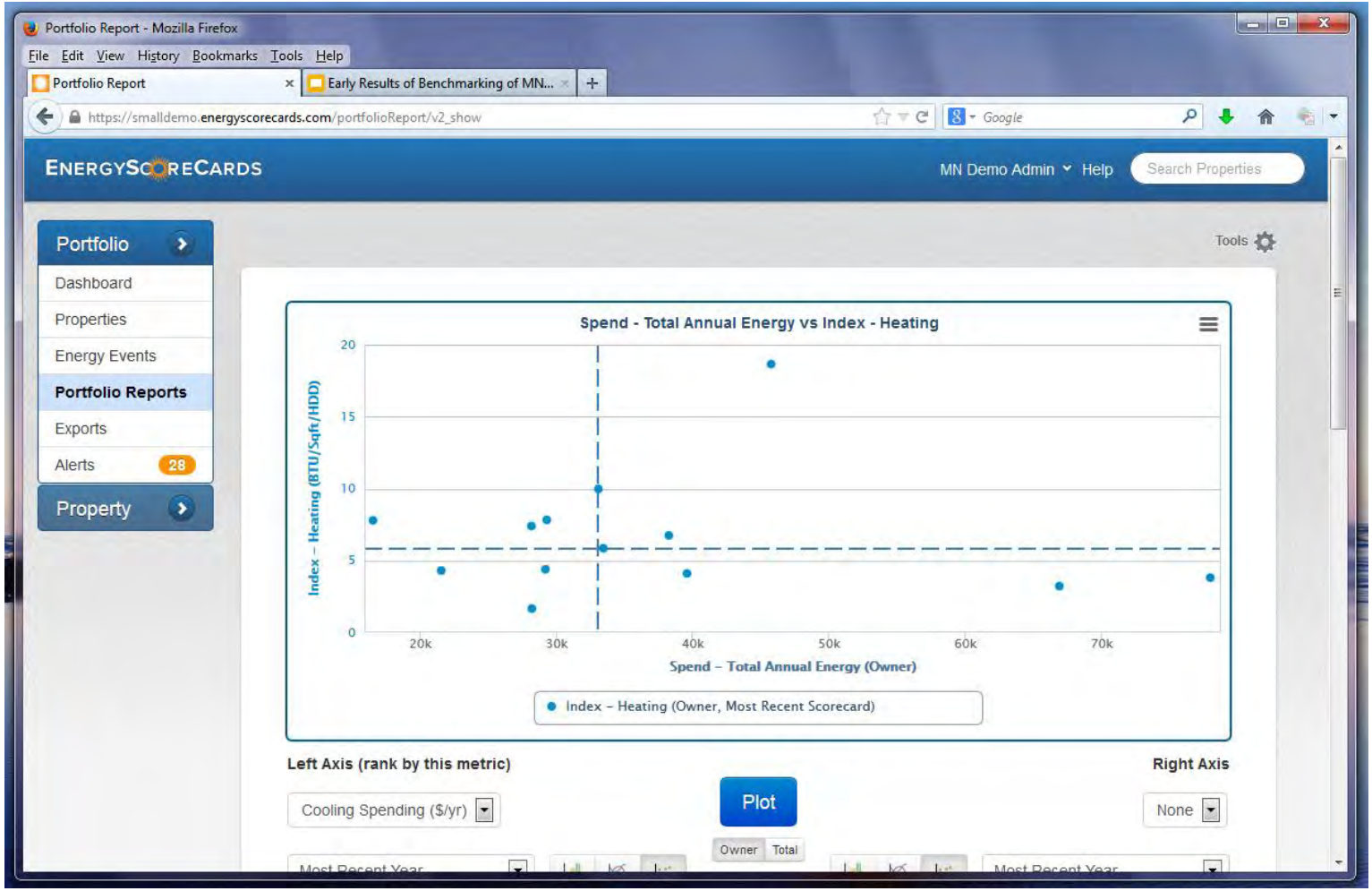
- Portfolio Analysis - show me what is and how it used
- Evaluating improvements
- Engagement dependent
- Motivating action/engaging staff/staff accountability

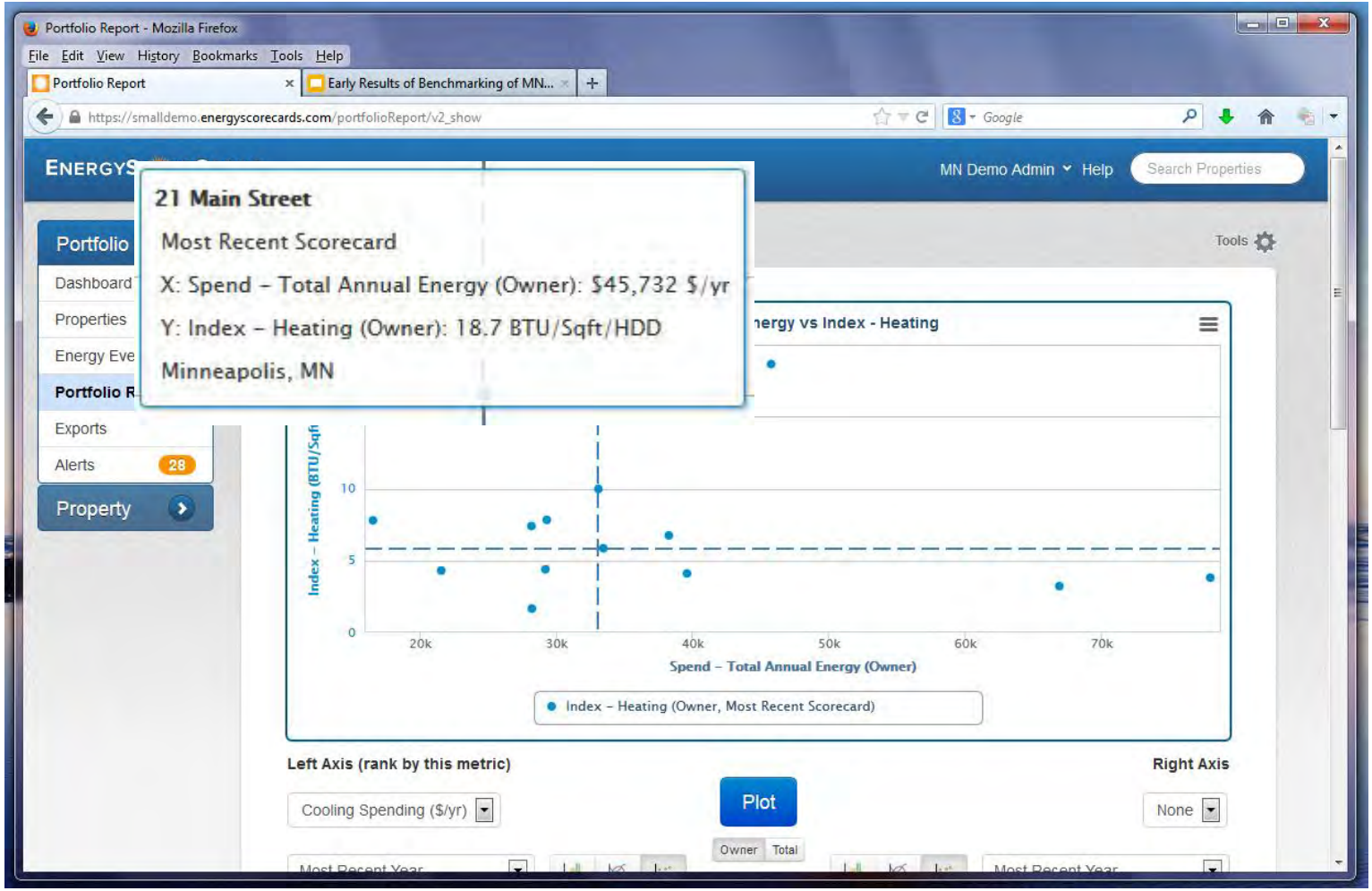

Portfolio Reports - Mozilla Firefox
Portfolio Reports
https://smalldemo.energyscorecards.com/portfolioReport/v2_portfolioCompare#
ENERGYSCORECARDS
MN Demo Admin
Help
Search Properties
Portfolio
Dashboard
Properties
Energy Events
Portfolio Reports
Exports
Alerts 28
Property
Properties: All
Tools
Owner Total
Weather Normalized Actual
There are 6 out of 13 properties with both scorecards
Energy Use
Full Year 2011
Most Recent Year
Difference
Unit
Owner Energy 12,917 13,390 473 4% mmBTU
Cooling Energy 189 188 -1 -1% mmBTU
Heating Energy 7,252 7,728 477 7% mmBTU
Electric Baseload Energy 3,053 3,053 -0 0% mmBTU
Fossil Fuel Baseload Energy 2,423 2,421 -2 0% mmBTU
Owner Energy by Property
Portfolio
Property
Full Year 2011
Most Recent Year
Difference
Unit

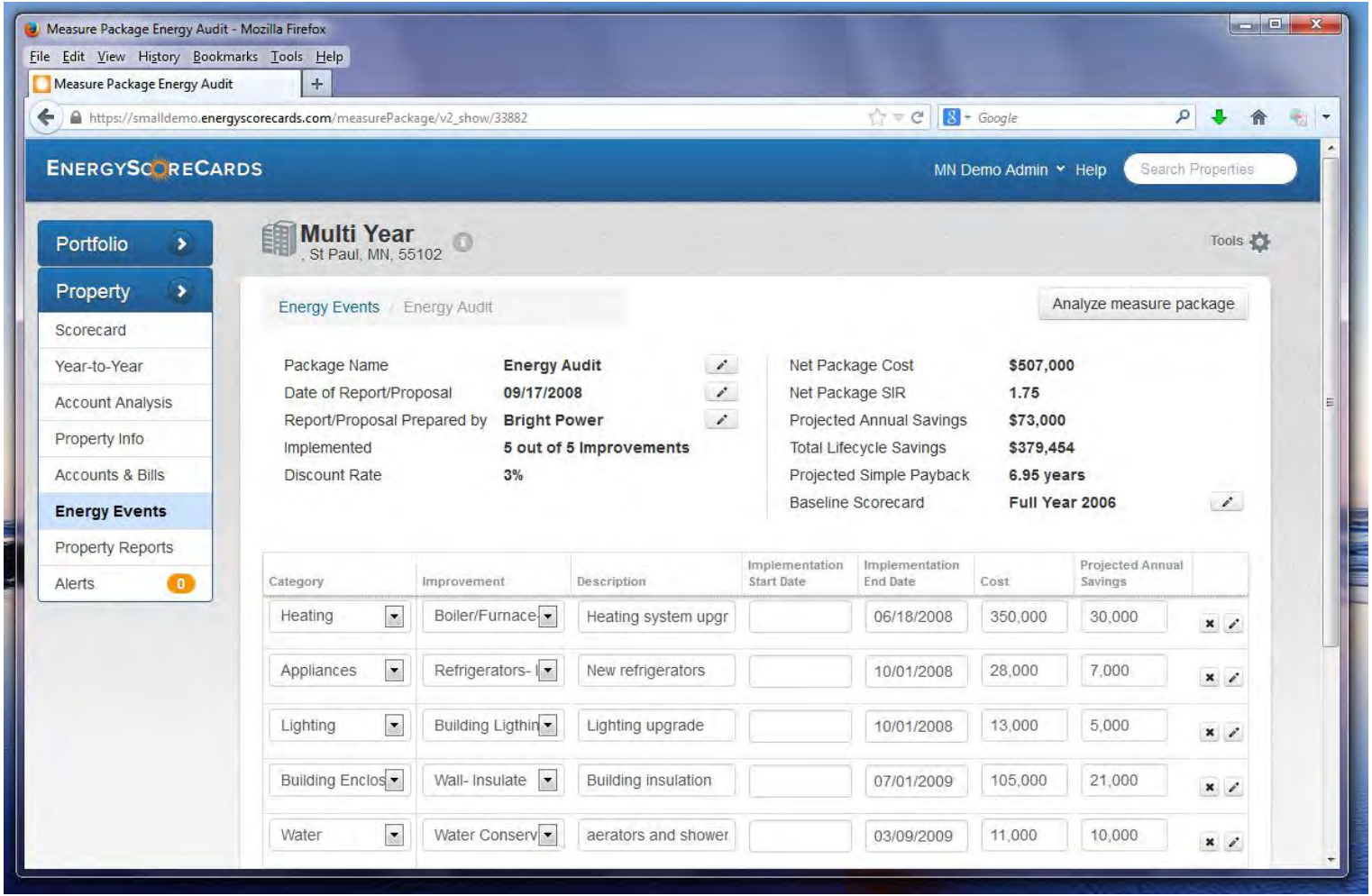

Portfolio Reports - Mozilla Firefox
File Edit View History Bookmarks Tools Help
Portfolio Reports
Early Results of Benchmarking of MN...
https://smalldemo.energyscorecards.com/portfolioReport/v2_list
Google
ENERGYSCORECARDS
MN Demo Admin
Help
Search Properties
Portfolio
Dashboard
Properties
Energy Events
Portfolio Reports
Exports
Alerts 28
Property
Properties: All
Tools
Portfolio Measurement & Verification
Compare Aggregated Energy and Water Values Across Portfolio
My Properties In Context
How do my properties compare to similar properties
Efficiency and Spending (with quadrants)
The most energy intensive and costly properties rise to the upper right to help identify the properties with the best opportunities for efficiency upgrades.
Properties
Last Updated
MN Demo 6
MN Demo 7
MN Demo 5
MN Demo 3
MN Demo 4
Lowest Energy Index
Demo C
ABC Apartments
MN Demo 6
MN Demo 1
MN Demo 5
Highest Energy Index
Multi Year
MN Demo 2
21 Main Street
MN Demo 5
MN Demo 1
Biggest (sqft)
Multi Year
MN Demo 2
MN Demo 7
MN Demo 3
Emerald Apartments
View All Properties (13)
Heating Spend and Heating Index
Ranks properties by annual heating spend and plots heating index. Find priority sites for heating system upgrades.
javascript:void(0)

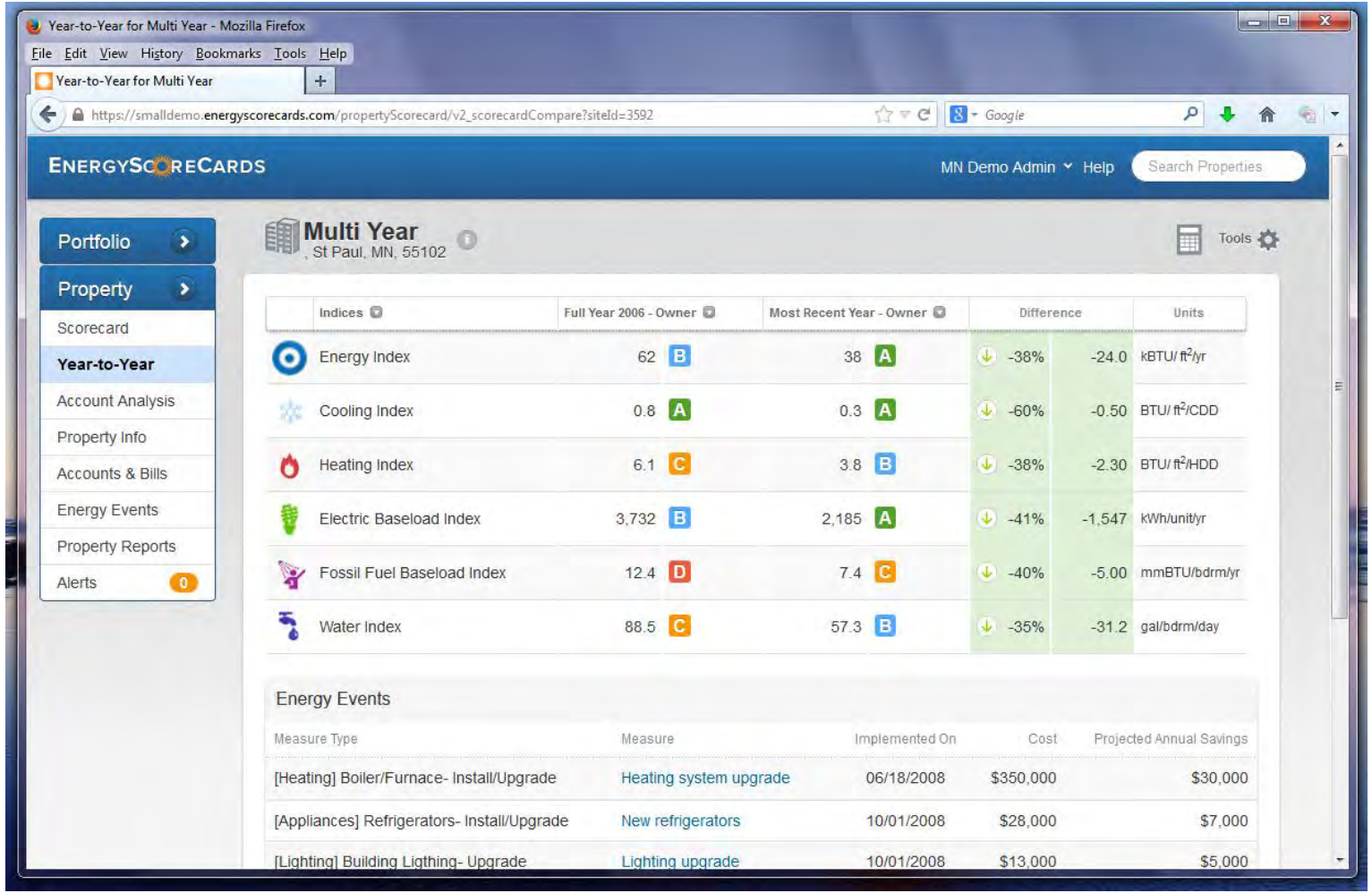

Portfolio Reports - Mozilla Firefox
File Edit View History Bookmarks Tools Help
Portfolio Reports
Early Results of Benchmarking of MN...
https://smalldemo.energyscorecards.com/portfolioReport/v2_list
ENERGYSCORECARDS
MN Demo Admin
Help
Search Properties
Portfolio
Properties: All
Tools
Properties
Last Updated
MN Demo 6
MN Demo 7
MN Demo 5
MN Demo 3
MN Demo 4
Lowest Energy Index
Demo C
ABC Apartments
MN Demo 6
MN Demo 1
MN Demo 5
Highest Energy Index
Multi Year
MN Demo 2
21 Main Street
MN Demo 5
MN Demo 1
Biggest (sqft)
Multi Year
MN Demo 2
MN Demo 7
MN Demo 3
Emerald Apartments
View All Properties (13)
Ranks properties by annual heating spend and plots heating index. Find priority sites for
Heating Spend and Heating Index
Ranks properties by annual heating spend and plots heating index. Find priority sites for
heating system upgrades.
javascript:void(0)

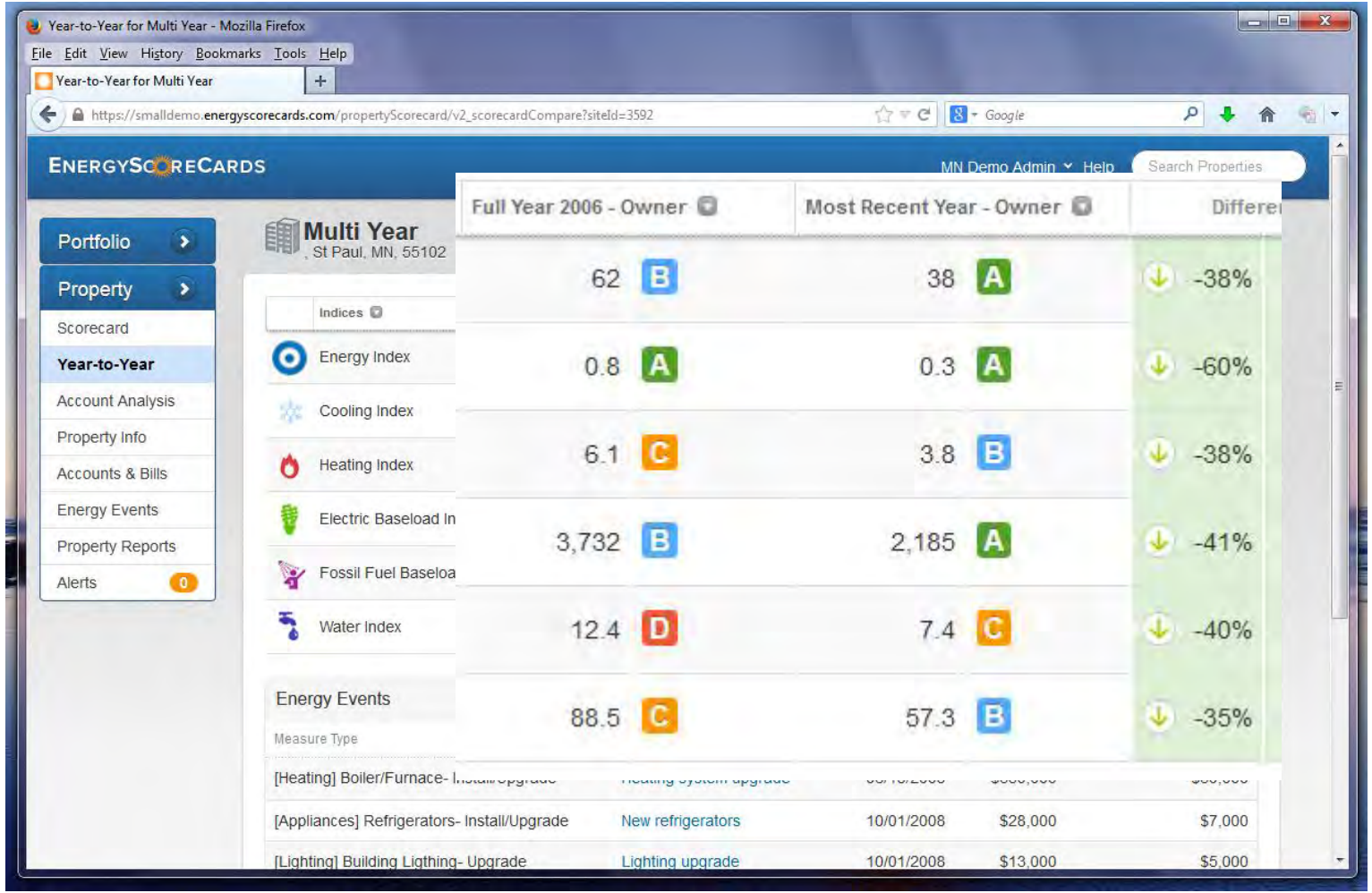

Portfolio Report - Mozilla Firefox
File Edit View History Bookmarks Tools Help
Portfolio Report
https://smalldemo.energyscorecards.com/portfolioReport/v2_compare
ENERGYSCORECARDS
MN Demo Admin
Help
Search Properties
Portfolio
Dashboard
Properties
Energy Events
Portfolio Reports
Exports
Alerts 28
Property
Properties: All
Tools
Properties in Context
Properties Ranked by Owner Energy Index
Owner vs. Total
Owner
Payment Code
Central Heating (TTO*)
Compare to Region
minn
Plot
A
B
C
D
Owner Energy Index (kBTU/Sqft/yr)
250
200
150
100
50
0
0
2
4
6
8
10
12
14
16
18
20
22
24
Selected Properties
Comparison Model


Portfolio Report - Mozilla Firefox
File Edit View History Bookmarks Tools Help
Portfolio Report
Early Results of Benchmarking of MN...
https://smalldemo.energyscorecards.com/portfolioReport/v2_show
ENERGYSCORECARDS
MN Demo Admin
Help
Search Properties
Portfolio
Dashboard
Properties
Energy Events
Portfolio Reports
Exports
Alerts 28
Property
Tools
Spend - Total Annual Energy vs Index - Heating
Index – Heating (BTU/Sqft/HDD)
20
15
10
5
0
20k
30k
40k
50k
60k
70k
Spend – Total Annual Energy (Owner)
Index – Heating (Owner, Most Recent Scorecard)
Left Axis (rank by this metric)
Right Axis
Cooling Spending ($/yr)
Plot
None
Owner
Total
Most Recent Year
Most Recent Year


Portfolio Report - Mozilla Firefox
File Edit View History Bookmarks Tools Help
Portfolio Report
Early Results of Benchmarking of MN...
https://smalldemo.energyscorecards.com/portfolioReport/v2_show
Google
MN Demo Admin
Help
Search Properties
21 Main Street
Most Recent Scorecard
X: Spend – Total Annual Energy (Owner): $45,732 $/yr
Y: Index – Heating (Owner): 18.7 BTU/Sqft/HDD
Minneapolis, MN
Portfolio
Dashboard
Properties
Energy Eve
Portfolio R
Exports
Alerts 28
Property
Tools
nergy vs Index - Heating
Index – Heating (BTU/Sqft)
10
5
0
20k
30k
40k
50k
60k
70k
Spend – Total Annual Energy (Owner)
Index – Heating (Owner, Most Recent Scorecard)
Left Axis (rank by this metric)
Right Axis
Cooling Spending ($/yr)
Plot
None
Owner
Total
Most Recent Year
Most Recent Year


Measure Package Energy Audit - Mozilla Firefox
File Edit View History Bookmarks Tools Help
Measure Package Energy Audit
https://smalldemo.energyscorecards.com/measurePackage/v2_show/33882
Google
ENERGYSCORECARDS
MN Demo Admin
Help
Search Properties
Portfolio
Property
Scorecard
Year-to-Year
Account Analysis
Property Info
Accounts & Bills
Energy Events
Property Reports
Alerts 0
Multi Year
, St Paul, MN, 55102
Tools
Energy Events / Energy Audit
Analyze measure package
Package Name Energy Audit
Date of Report/Proposal 09/17/2008
Report/Proposal Prepared by Bright Power
Implemented 5 out of 5 Improvements
Discount Rate 3%
Net Package Cost $507,000
Net Package SIR 1.75
Projected Annual Savings $73,000
Total Lifecycle Savings $379,454
Projected Simple Payback 6.95 years
Baseline Scorecard Full Year 2006
Category
Improvement
Description
Implementation Start Date
Implementation End Date
Cost
Projected Annual Savings
Heating
Boiler/Furnace
Heating system upgr
06/18/2008
350,000
30,000
Appliances
Refrigerators-
New refrigerators
10/01/2008
28,000
7,000
Lighting
Building Ligthin
Lighting upgrade
10/01/2008
13,000
5,000
Building Enclos
Wall- Insulate
Building insulation
07/01/2009
105,000
21,000
Water
Water Conserv
aerators and shower
03/09/2009
11,000
10,000


Year-to-Year for Multi Year - Mozilla Firefox
File Edit View History Bookmarks Tools Help
Year-to-Year for Multi Year
https://smalldemo.energyscorecards.com/propertyScorecard/v2_scorecardCompare?siteId=3592
Google
ENERGYSCORECARDS
MN Demo Admin
Help
Search Properties
Portfolio
Property
Scorecard
Year-to-Year
Account Analysis
Property Info
Accounts & Bills
Energy Events
Property Reports
Alerts 0
Multi Year
, St Paul, MN, 55102
Tools
Indices
Full Year 2006 - Owner
Most Recent Year - Owner
Difference
Units
Energy Index 62 B 38 A -38% -24.0 kBTU/ ft2/yr
Cooling Index 0.8 A 0.3 A -60% -0.50 BTU/ ft2/CDD
Heating Index 6.1 C 3.8 B -38% -2.30 BTU/ ft2/HDD
Electric Baseload Index 3,732 B 2,185 A -41% -1,547 kWh/unit/yr
Fossil Fuel Baseload Index 12.4 D 7.4 C -40% -5.00 mmBTU/bdrm/yr
Water Index 88.5 C 57.3 B -35% -31.2 gal/bdrm/day
Energy Events
Measure Type
Measure
Implemented On
Cost
Projected Annual Savings
[Heating] Boiler/Furnace- Install/Upgrade
Heating system upgrade
06/18/2008
$350,000
$30,000
[Appliances] Refrigerators- Install/Upgrade
New refrigerators
10/01/2008
$28,000
$7,000
[Lighting] Building Ligthing- Upgrade
Lighting upgrade
10/01/2008
$13,000
$5,000


Year-to-Year for Multi Year - Mozilla Firefox
File Edit View History Bookmarks Tools Help
Year-to-Year for Multi Year
https://smalldemo.energyscorecards.com/propertyScorecard/v2_scorecardCompare?siteId=3592
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MN Demo Admin
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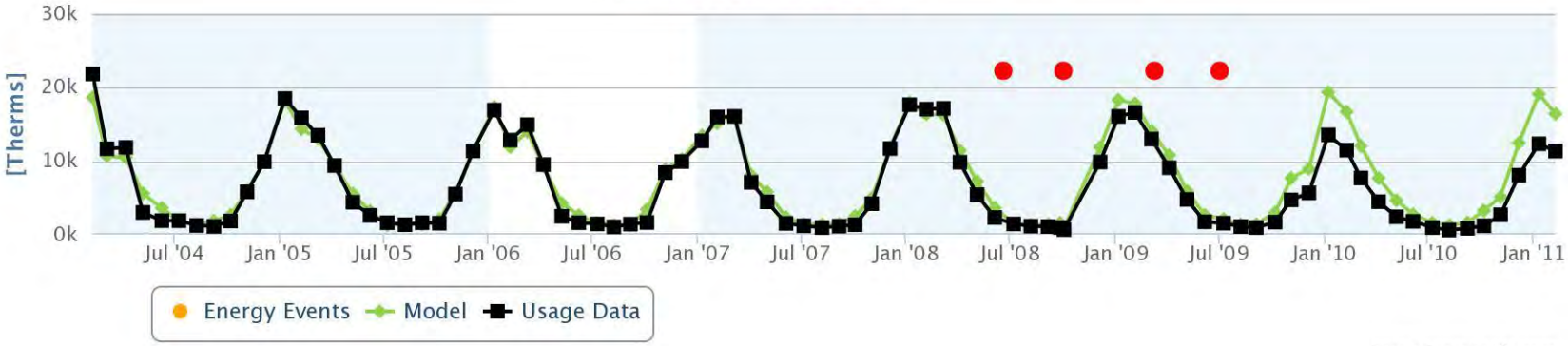
Property
Scorecard
Year-to-Year
Account Analysis
Property Info
Accounts & Bills
Energy Events
Property Reports
Alerts 0
Multi Year
, St Paul, MN, 55102
Full Year 2006 - Owner
Most Recent Year - Owner
Differe
Indices
Energy Index
62 B
38 A
-38%
Cooling Index
0.8 A
0.3 A
-60%
Heating Index
6.1 C
3.8 B
-38%
Electric Baseload In
3,732 B
2,185 A
-41%
Fossil Fuel Baseloa
Water Index
12.4 D
7.4 C
-40%
Energy Events
88.5 C
57.3 B
-35%
Measure Type
[Heating] Boiler/Furnace- I
[Appliances] Refrigerators- Install/Upgrade
New refrigerators
10/01/2008
$28,000
$7,000
[Lighting] Building Ligthing- Upgrade
Lighting upgrade
10/01/2008
$13,000
$5,000

Heat and hot water

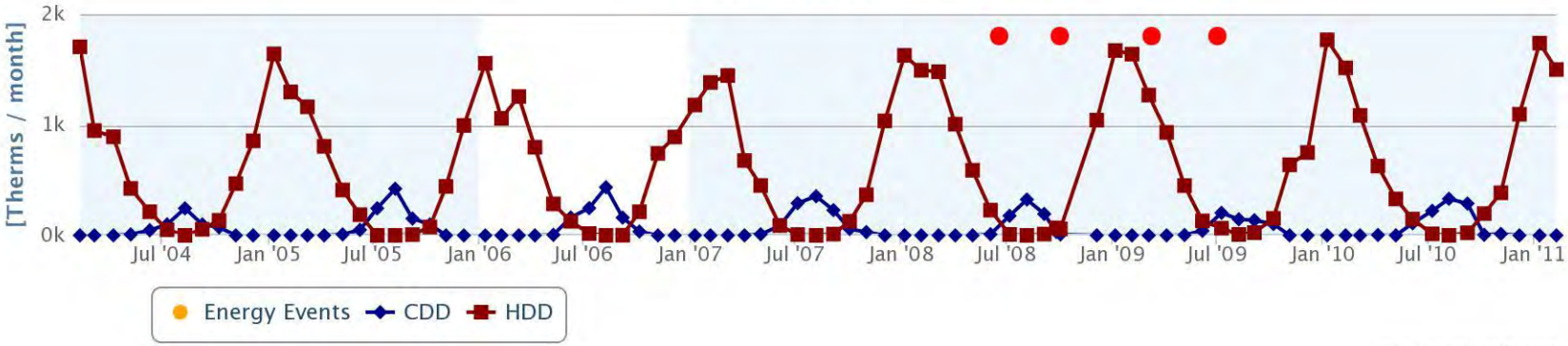
(08 Feb 2004 – 08 Feb 2011)



EnergyScoreCards.com

Heat and hot water

(08 Feb 2004 – 08 Feb 2011)



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Engagement Dependent


EnergyScoreCards Minnesota

RESOURCE SHEET

RESOURCE SHEET: Tenant Newsletter Ideas

[These are examples of newsletter articles to build resident engagement in their home's performance. If you provide only one piece of information, Our Current ScoreCard is best. If you have space for two items and are tracking tenant data, include How do You Stack Up?. If there are significant changes use [Building Name] Trends. EnegyScoreCards Minnesota also recommends including a Quick Tip of one simple energy- or water-saving action tenants can take to improve building performance. Find suggested tips in the Enterprise Resident Engagement Tools, especially on the Resident Engagement Cards located at this website.]

Our Current ScoreCard

Happy Apartments Trends

Happy Apartments monthly gas use is shown in this chart. During the last two months (December 2011 and January 2012), our gas use has been below last year's usage! This is due to our recent improvements in equipment. Thanks for your patience during the construction!

The black line shows actual utility usage. The green line shows what we would have used if nothing changed. The gap between black and green line shows savings from improvements.

Connect to decision makers and energy users

Owners

Managers

Staff

- Maintenance Personnel
- Caretakers

Tenants

Engagement Process

EnergyScoreCards Minnesota

WORKSHEET

WORKSHEET: Develop a Prioritized Equipment Replacement Plan

Use EnergyScoreCards to assist with prioritizing the equipment replacement schedule. Use it to identify what end uses are the most inefficient and/or make up most of the annual utility budget. Generally the greatest opportunity for energy and cost savings are the most inefficient areas that are also a significant portion of the utility budget.

STEP 1: If you haven't done this already, use "Quick Guide: Finding Waste in your Portfolio" and "Quick Guide: Finding Waste in your Building" to identify which end uses to prioritize. Write a number next to each priority area for equipment replacement you have identified, with "1" being the highest priority:

____ Waste
____ Apartment Cooling
____ Common Area Cooling
____ Apartment Heating
____ Common Area Heating
____ Apartment non-seasonal electric (____ Appliances, ____ Lighting, ____ Ventilation)
____ Common area non-seasonal electric (____ Appliances; ____ Lighting, ____ Ventilation)
____ Domestic Hot Water
____ Common area non-seasonal fossil fuel (e.g. Laundry, community kitchen)
____ Other _____

STEP 2: List the major equipment and building systems in your priority areas identified above.

STEP 3: Use the Bright Power Multifamily Energy Reference Guide to choose energy, water, and cost efficient options for renovations or equipment replacement in each area you have identified.

STEP 4: Share this list with your building staff or managers to learn which items may be scheduled for near-term replacement. Before making any significant improvements, schedule an energy audit so that building systems are analyzed accurately and so the best equipment is selected for your property. See "Quick Guide: Evaluate Capital Upgrades" for help considering larger capital improvements.

STEP 5: Replace equipment with efficient options. Be sure to:

- Update requirements for replacements and document them using the Worksheet: Standard Replacement Equipment. (Use "Make a copy" under "File" on the Google Doc here to access an editable spreadsheet.)
- Train your maintenance team on new new equipment
- Provide your maintenance team with manuals
- Check for available rebates from your local utility
- Record the updates as an Energy Event in EnergyScoreCards, see Quick Guide: Record Energy Events

STEP 6: Quantify the results. Use the Quick Guide: Track Improvements to evaluate your success. If you do not see the savings expected, figure out why.

EnergyScoreCards green communities Minnesota Housing

EnergyScoreCards Minnesota is an initiative of EnergyScoreCards, Minnesota Green Communities, University of Minnesota Center for Sustainable Building Research, Minnesota Housing, and Center for Energy and Environment. This two-year effort aims to reduce utility costs, energy and water use, and carbon emissions in multifamily housing through energy benchmarking.

Identify - Create Action Plan - Act

Direct Outreach/Support

- technical support
  - phone/email/face to face
- education
- access to resources
- programs and tools

Motivating action/engaging staff/staff accountability

EnergyScoreCards Minnesota

WORKSHEET

WORKSHEET: Develop a Prioritized Equipment Replacement Plan

Use EnergyScoreCards to assist with prioritizing the equipment replacement schedule. Use it to identify what end uses are the most inefficient and/or make up most of the annual utility budget. Generally the greatest opportunity for energy and cost savings are the most inefficient areas that are also a significant portion of the utility budget.

STEP 1: If you haven't done this already, use "Quick Guide: Finding Waste in your Portfolio" and "Quick Guide: Finding Waste in your Building" to identify which end uses to prioritize. Write a number next to each priority area for equipment replacement you have identified, with "1" being the highest priority:

____ Waste
____ Apartment Cooling
____ Common Area Cooling
____ Apartment Heating
____ Common Area Heating
____ Apartment non-seasonal electric (____ Appliances, ____ Lighting, ____ Ventilation)
____ Common area non-seasonal electric (____ Appliances, ____ Lighting, ____ Ventilation)
____ Domestic Hot Water
____ Common area non-seasonal fossil fuel (e.g. Laundry, community kitchen)
____ Other _____

STEP 2: List the major equipment and building systems in your priority areas identified above.

STEP 3: Use the Bright Power Multifamily Energy Reference Guide to choose energy, water, and cost efficient options for renovations or equipment replacement in each area you have identified.

STEP 4: Share this list with your building staff or managers to learn which items may be scheduled for near-term replacement. Before making any significant improvements, schedule an energy audit so that building systems are analyzed accurately and so the best equipment is selected for your property. See "Quick Guide: Evaluate Capital Upgrades" for help considering larger capital improvements.

STEP 5: Replace equipment with efficient options. Be sure to:

- Update requirements for replacements and document them using the Worksheet: Standard Replacement Equipment. (Use "Make a copy" under "File" on the Google Doc here to access an editable spreadsheet.)
- Train your maintenance team on new new equipment
- Provide your maintenance team with manuals
- Check for available rebates from your local utility
- Record the updates as an Energy Event in EnergyScoreCards, see Quick Guide: Record Energy Events

STEP 6: Quantify the results. Use the Quick Guide: Track Improvements to evaluate your success. If you do not see the savings expected, figure out why.

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TOOLS

Budgeting

Evaluating Upgrades

Finding Waste

Maintenance Practices

Marketing

Developing a Sourcing Plan

Staff and Tenant Engagement

Policy Implications

The Policy Implications

Barriers

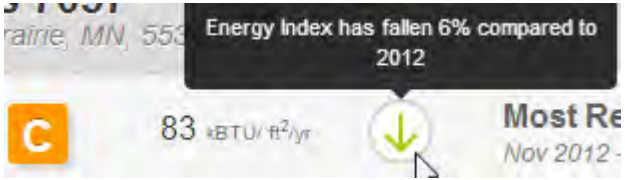
Opportunities

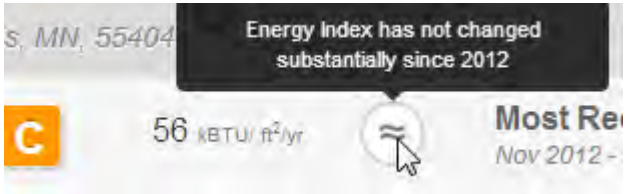
Progress

The Policy Implications

We need

- Data
- to Make Decisions Based on Data
- Good Policy
- Good Programs

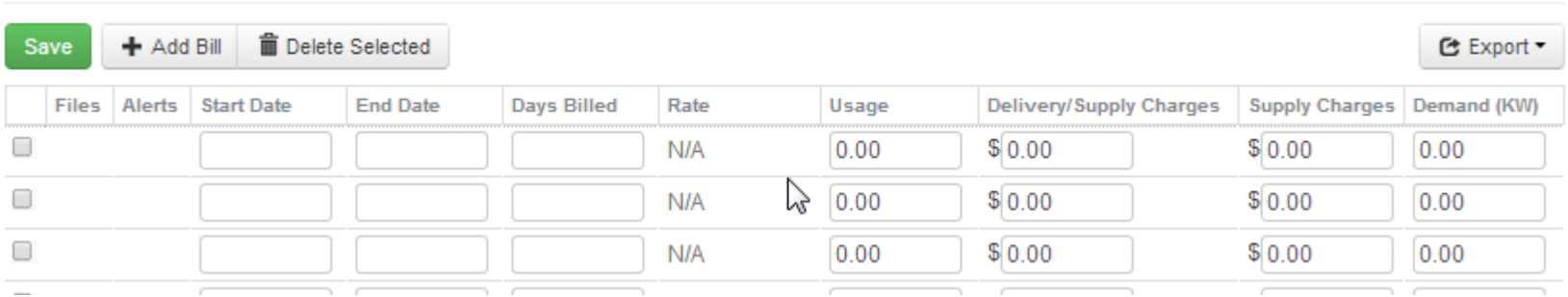




Data Access Matters

Benchmarking most useful with

- whole building data (owner and tenants)
- automated uploading



Using Data Matters

O&M Engagement

- Benchmarking data useful... when used

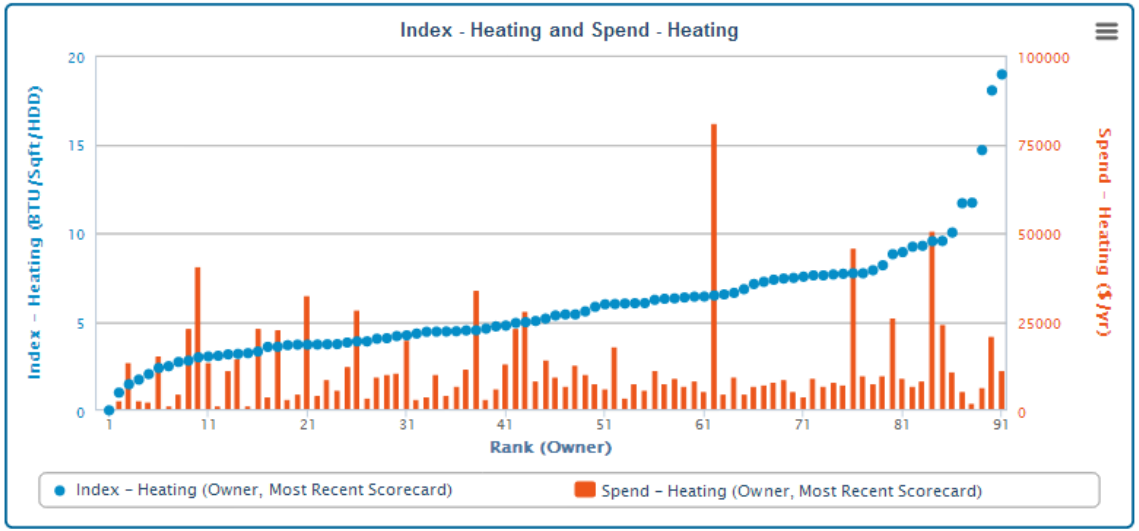
Set Goals

Building area	Current Index	Plan for the next 6-months (circle one)		Target Index (optional)
Cooling	*btu/sf/CDD*	*improve*	*maintain*	*btu/sf/CDD*
Heating	*btu/sf/HDD*	*improve*	*maintain*	*btu/sf/HDD*
Non-seasonal electricity (lights, appliances, fans, pumps)	*kWh/unit/yr*	*improve*	*maintain*	*kWh/unit/yr*
Non-seasonal fossil fuel (hot water, laundry, cooking)	*mmBTU/bdrm/yr*	*improve*	*maintain*	*mmBTU/bdrm/yr*
Water	*gal/bdrm/day*	*improve*	*maintain*	*gal/bdrm/day*

Who Can Use Benchmarking Data?

And How?

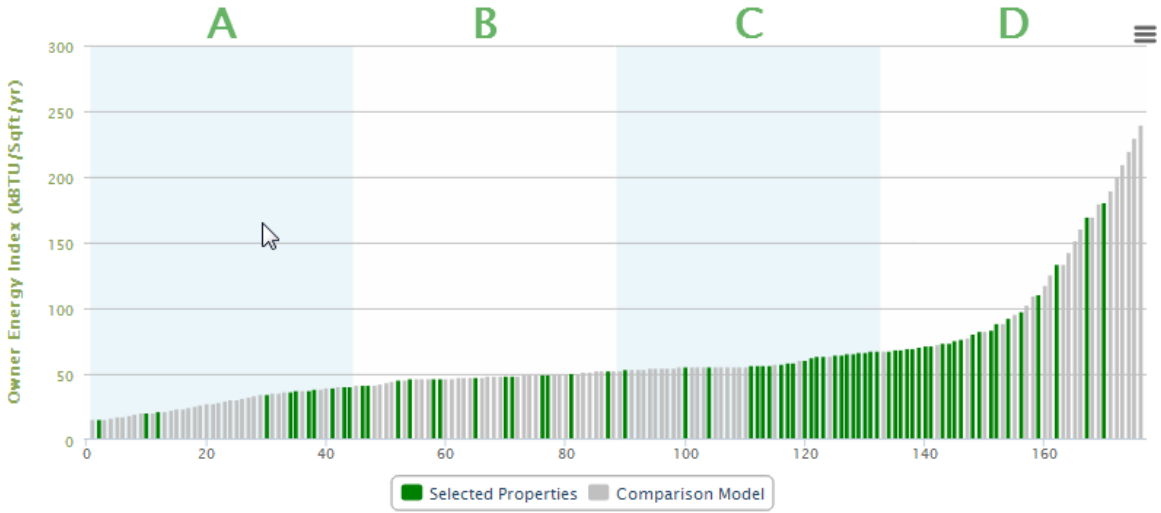
- Portfolio Managers
- Utilities
- Program Admn
- Architects



Measurement is a Prerequisite AND More is Needed

Measurement is a critical step

Measurement is <u>Not Sufficient!</u>



Overcoming Barriers

User-created barriers

Program design barriers

Diverse Sector → Diverse Solutions

Diversity

- Metering
- Public/For Profit/Non-Profit
- Owner/Manager
- Portfolio Size
- Market-Rate/Affordable
- Building Type

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Diverse Sector → Diverse Solutions

Responses

- One-stop Programs
- Varied Outreach
- Design for all Incomes
- Multiple Pathways
- Escalating Incentives
- Financing Tools
- Partners

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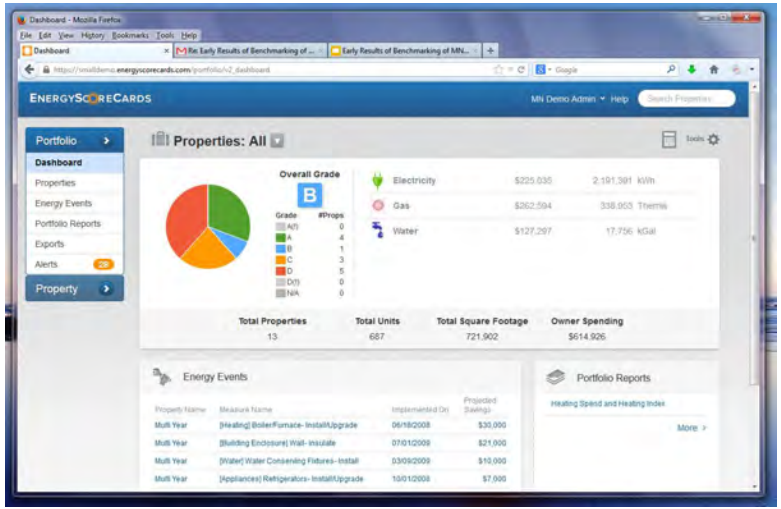
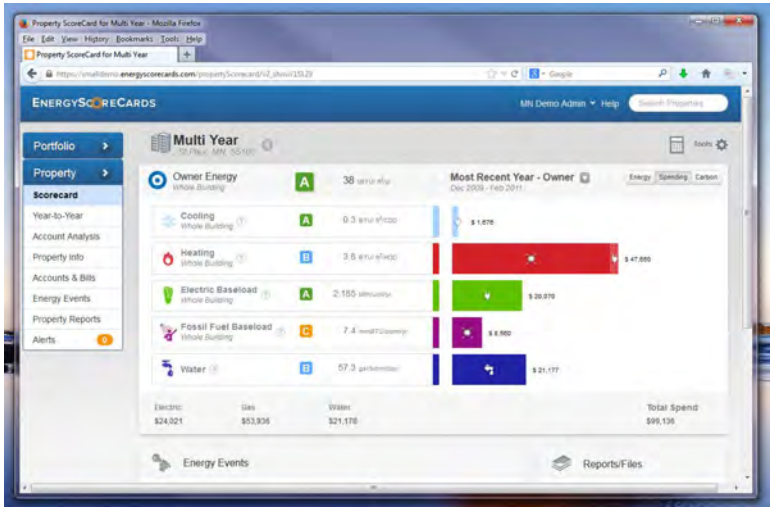
Questions?


ENERGYSCORECARDS
Portfolio
Dashboard
Properties
Energy Events
Portfolio Reports
Exports
Alerts
Property
Properties: All
Overall Grade
B
Electricity
Gas
Water
Total Properties
13
Total Units
687
Total Square Footage
721,902
Owner Spending
$614,926
Energy Events
Portfolio Reports


ENERGYSCORECARDS
Portfolio
Property
Scorecard
Year-to-Year
Account Analysis
Property Info
Accounts & Bills
Energy Events
Property Reports
Alerts
Multi Year
Owner Energy
Most Recent Year - Owner
Cooling
Heating
Electric Baseload
Fossil Fuel Baseload
Water
Energy Events
Reports/Files