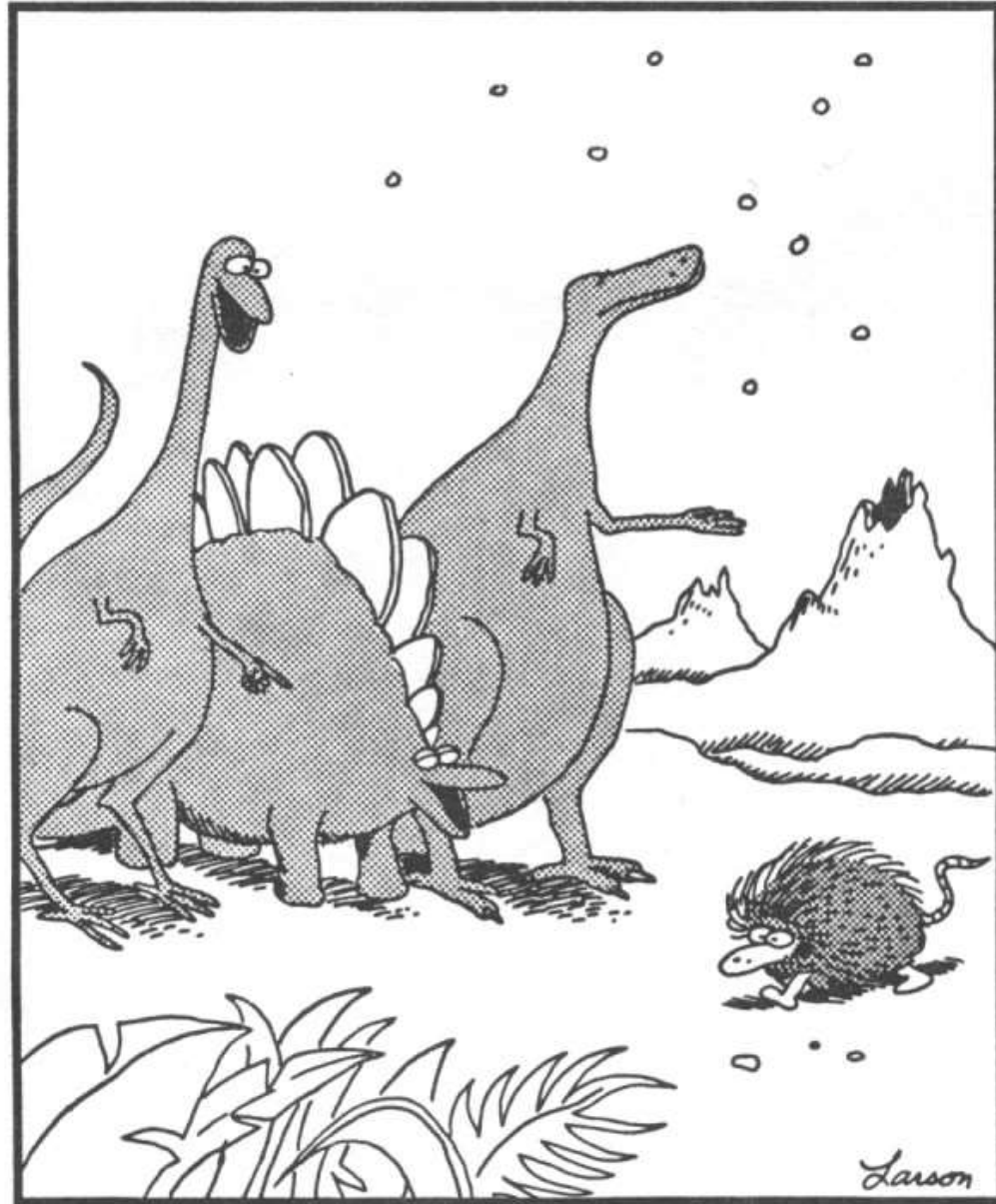


Are you evolving?



Meet Your Speakers

Jason LaFleur

Eco Achievers



Certified Passive House Consultant (CPHC),
PHIUS+ Rater,
PHIUS+ Large Building Verifier,
NGBS Green Verifier,
LEED Green Rater,
RESNET HERS Rater

Professional Builder's
40 Under 40 List,
March 2017

Michael Hobbs

PahRoo Appraisal



MAI Designation
SRA Designation
Valuation of Sustainable Buildings – Certificate
LEED Green Associate

Session Description

Green MLS Data has existed for years in some markets but the analysis of that data is scarce. In this discussion session, presenters will analyze national trends in green and sustainable homes in comparison to the local Chicago market. Learn how one market of green homes and HERS-rated homes are performing in the urban core and the surrounding suburban metro market. What features of a HERS-rated home are driving the value?



A typical
day at the
office.



A(nother)
typical
day at the
office.

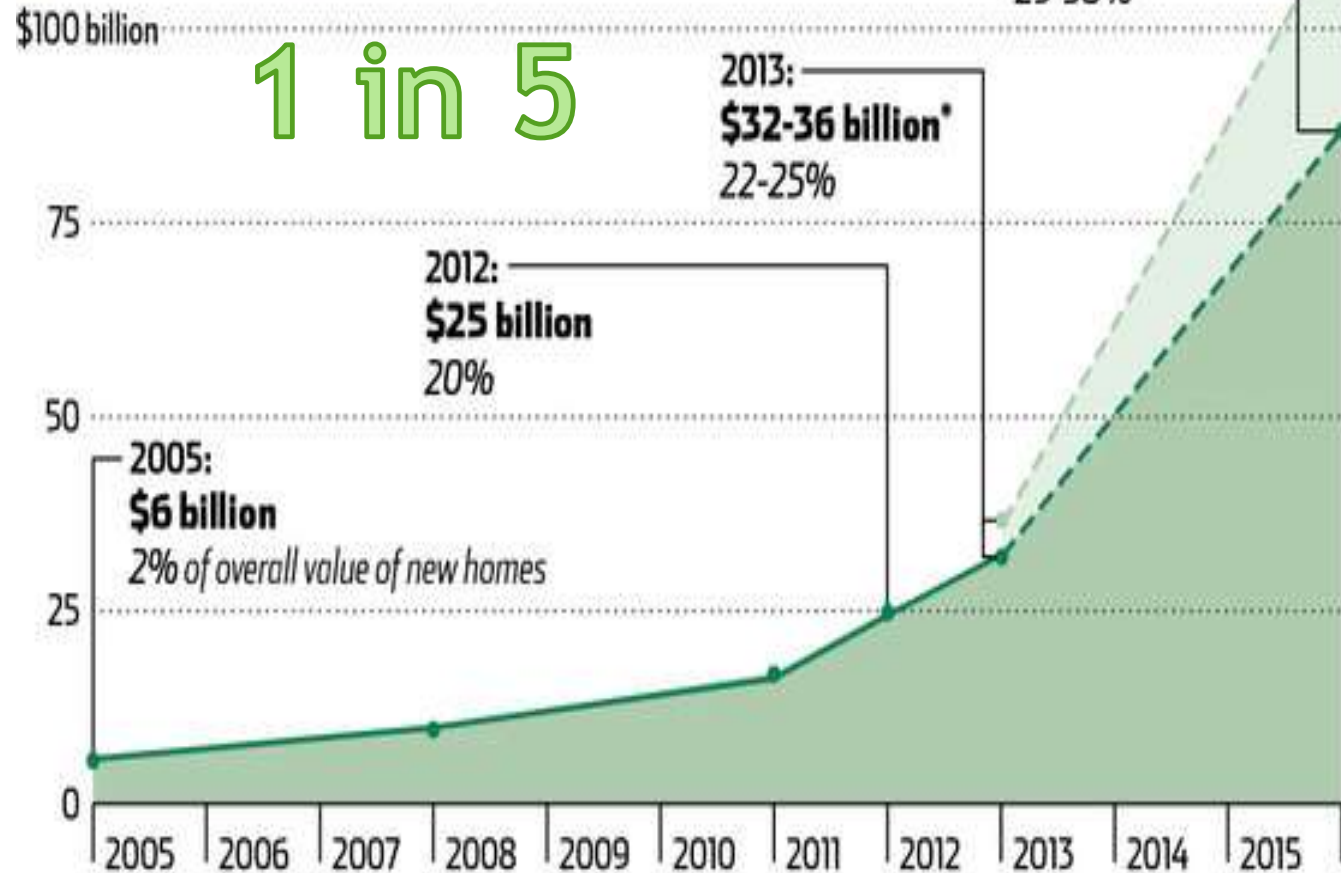
1 in 5



Green Growing

Green housing projects have been growing steadily, accounting for 20% of all newly built homes last year.

■ Base Estimate ■ Upper Estimate



Source: McGraw Hill Construction

* Projected

The Wall Street Journal

206,000

**HERS Rated
Homes in 2016**

37% of all new homes sold in the nation

As of Feb 7, 2017



Average HERS[®] Index Score for 2016



More energy efficient
than in 2006



More energy efficient
than in the 1970s



Annual energy bill savings of
\$268 MILLION



Reduction of carbon
dioxide emissions by
905,025 tons



Multifamily dollars spent
as a percentage of
total energy efficiency spending





Real Estate Valuation

- 32 homes
- Ages 4 - 107 years old
- 2%-5% sales price premium

WHAT IS GREEN WORTH?

Unveiling High-Performance Home Premiums in Washington, D.C.

Sandra Adomatis, SRA, LEED Green Associate
Adomatis Appraisal Services

September 2015





Home Value + Solar

- 43 homes with solar PV
- Across 6 states
- \$3.78 per watt premium
\$3.57 per watt installed cost (Oct 2016)

<https://emp.lbl.gov/>

Average U.S. Homeowner Costs



PHIUS Certified

0.40 ach@50
4.31 kBTU/ft²yr
HERS 27

R25 ICF Wall C
6" EPS (R24)

R80 blown cellulose
6" EPS sub slab

2 ductless mini split
1 ducted ERV

Solar thermal Domestic Hot Water
Heat pump hot water



Energy Demands with Reference to the Treated Floor Area				
Treated Floor Area:	3598 ft ²			
	Applied:	Monthly Method	PH Certificate:	Fulfilled?
Specific Space Heat Demand:	4.31	kBTU/(ft ² yr)	4.75 kBTU/(ft ² yr)	Yes
Pressurization Test Result:	0.40	ACH ₅₀	0.6 ACH ₅₀	Yes
Specific Primary Energy Demand (DHW, Heating, Cooling, Auxiliary and Household Electricity):	34.6	kBTU/(ft ² yr)	38.0 kBTU/(ft ² yr)	Yes
Specific Primary Energy Demand (DHW, Heating and Auxiliary Electricity):	20.3	kBTU/(ft ² yr)		
Specific Primary Energy Demand Energy Conservation by Solar Electricity:		kBTU/(ft ² yr)		
Heating Load:	3.69	BTU/(ft ² hr)		
Frequency of Overheating:		%	over 77.0 °F	
Specific Useful Cooling Energy Demand:	0.96	kBTU/(ft ² yr)	4.75 kBTU/(ft ² yr)	Yes
Cooling Load:	2.91	BTU/(ft ² hr)		



Home Energy Rating Certificate

1430 Jackson Ave.
River Forrest, IL 60305



**5 Stars Plus
Confirmed
HERS Index: 27**

General Information

Conditioned Area	4763 sq. ft.	House Type	Single-family detached
Conditioned Volume	46023 cubic ft.	Foundation	Conditioned basement
Bedrooms	5		

Mechanical Systems Features

Heating:	Air-source heat pump, Electric, 10.0 HSPF.
Cooling:	Air-source heat pump, Electric, 26.0 SEER.
Water Heating:	Conventional, Electric, 0.93 EF, 50.0 Gal.
Duct Leakage to Outside	NA
Ventilation System	Balanced: ERV, 145 cfm, 69.0 watts.
Programmable Thermostat	Heat=No; Cool=No

Building Shell Features

Ceiling Flat	R-96.0	Slab	R-33.0 Edge, R-34.8 Under
Sealed Attic	N/A	Exposed Floor	None
Vaulted Ceiling	N/A	Window Type	Zola
Above Grade Walls	R-48.8	Infiltration Rate	Htg: 214 Clg: 214 CFM50
Foundation Walls	R-48.0	Method	Blower door test

Lights and Appliance Features

Percent Interior Lighting	80.00	Range/Oven Fuel	Electric
Percent Garage Lighting	80.00	Clothes Dryer Fuel	Electric
Refrigerator (kWh/yr)	460.00	Clothes Dryer EF	3.01
Dishwasher Energy Factor	0.00	Ceiling Fan (cfm/Watt)	0.00

Registry ID	951357955
Rating Number	12202012
Certified Energy Rater	Andy Scott
Rating Date	1-28-2013
Rating Ordered For	Lema Residence

Estimated Annual Energy Cost

Use	MMBtu	Cost	Percent
Heating	5.2	\$115	11%
Cooling	2.9	\$64	6%
Hot Water	6.0	\$132	13%
Lights/Appliances	33.7	\$741	70%
Photovoltaics	-0.0	\$-0	-0%
Service Charges		\$0	0%
Total	47.9	\$1052	100%

Criteria

This home meets or exceeds the minimum criteria for the following:

\$1,052 As-Built Utility Costs
\$2,649 Baseline Utility Costs

\$1,597 annual savings

TITLE
 Company
 Address
 City, State, Zip
 Phone #
 Fax #

The Home Energy Rating Standard Disclosure for this home is available from the rating provider.

REM/Rate - Residential Energy Analysis and Rating Software v14.2

This information does not constitute any warranty of energy cost or savings.

© 1985-2013 Architectural Energy Corporation, Boulder, Colorado.

The Appraiser's Green Toolkit

Net Present Value (NPV)

HERS = 27

- REM Rate reference home: \$2,649
- REM Rate Passive House: \$1,052 (**\$1,597 savings**)

Term	Rate	Savings	Present Value
30 yr	4%	\$1597	\$27,615

Appraiser used to support energy adjustment of 4%

More at www.ecoachievers.com/toolkit

It's Okay!

Instruct your client to request their Lender engage an experienced Green Appraiser!

Appraised Value & Energy Efficiency: Getting it Right



While location, design, and price are a home buyer's main considerations, surveys show that buyers rank energy efficiency as one of the most desirable features, and importantly - one they're willing to pay more for.¹ However, energy efficiency can be overlooked in the appraisal process for a variety of reasons, including a lack of access to quality data, underwriting impediments, and appraiser qualifications. Many appraisers may not be aware of the unique features of an energy-efficient home. However, there are many specially-trained appraisers who are qualified to assess the value of these features that are often hidden behind the drywall. One way to know that a home is built energy efficiently is to know which energy code it was built to.

According to the U.S. Department of Energy, homes built to the 2012 or 2015 International Energy Conservation Code (IECC) are 15-16% more efficient than those built to the 2009 IECC or earlier. They will have fewer drafts, be more comfortable to live in, and have lower monthly energy bills.

Fannie Mae, Freddie Mac and FHA guidelines require appraisers to consider the energy efficient features of the home, and if the market supports an adjustment in the appraised value, one must be made, but an average appraiser won't take this into account if they aren't aware of it.



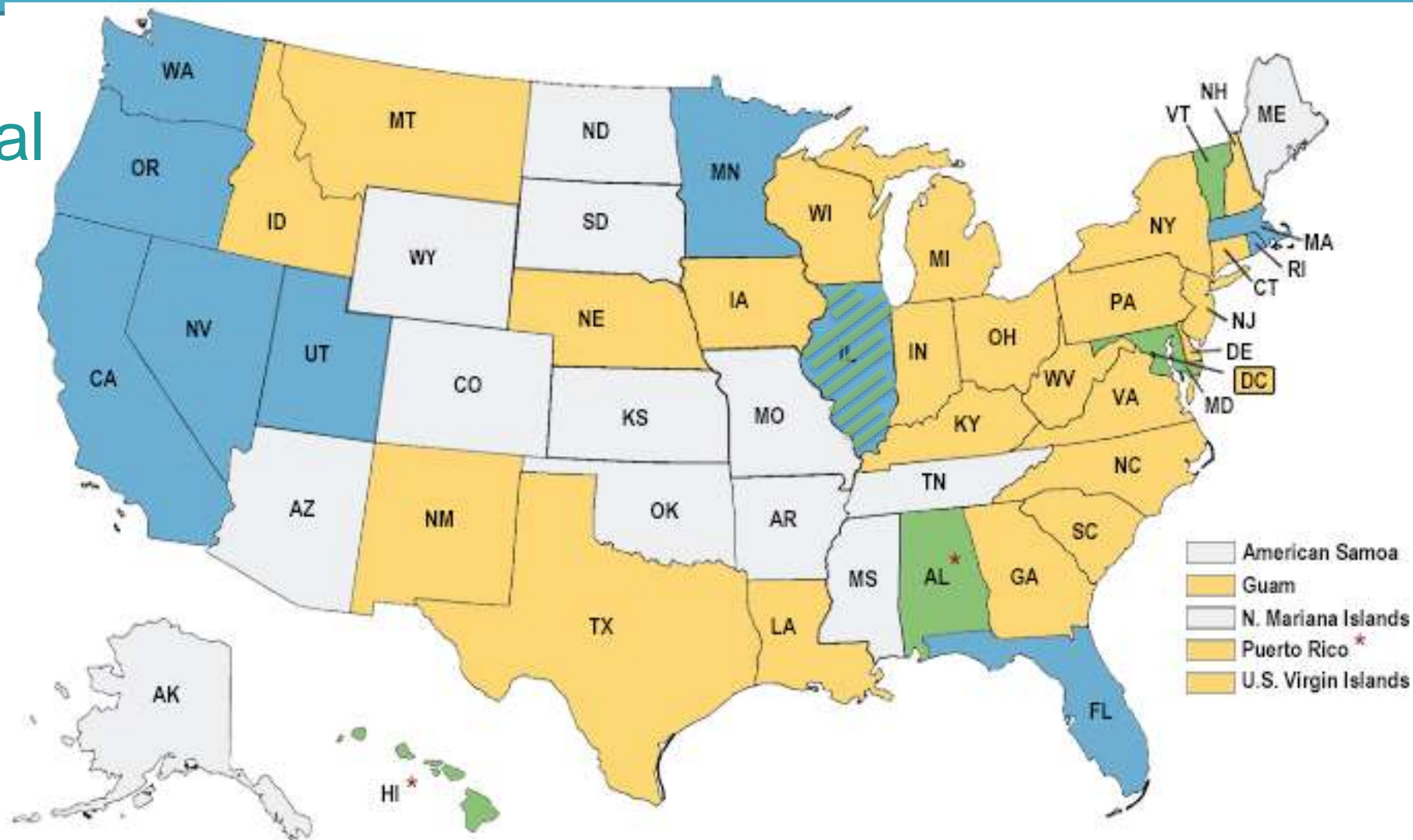
A ready-made solution exists.

Fannie Mae, Freddie Mac and FHA guidelines require lenders to choose competent appraisers who have the requisite knowledge required to perform a professional quality appraisal for the specific geographic location and particular property type.^{2,3,4}

Appraisers who are specially trained on energy-efficient / high-performing homes will analyze market trends

More at www.ecoachievers.com/toolkit

Getting technical



Baselines Vary

* Adopted new Code to be effective at a later date.

Comparison of Residential* Energy Codes & Standards

(on a relative HERS index)

* Single Family, Multifamily (low rise)

Legend

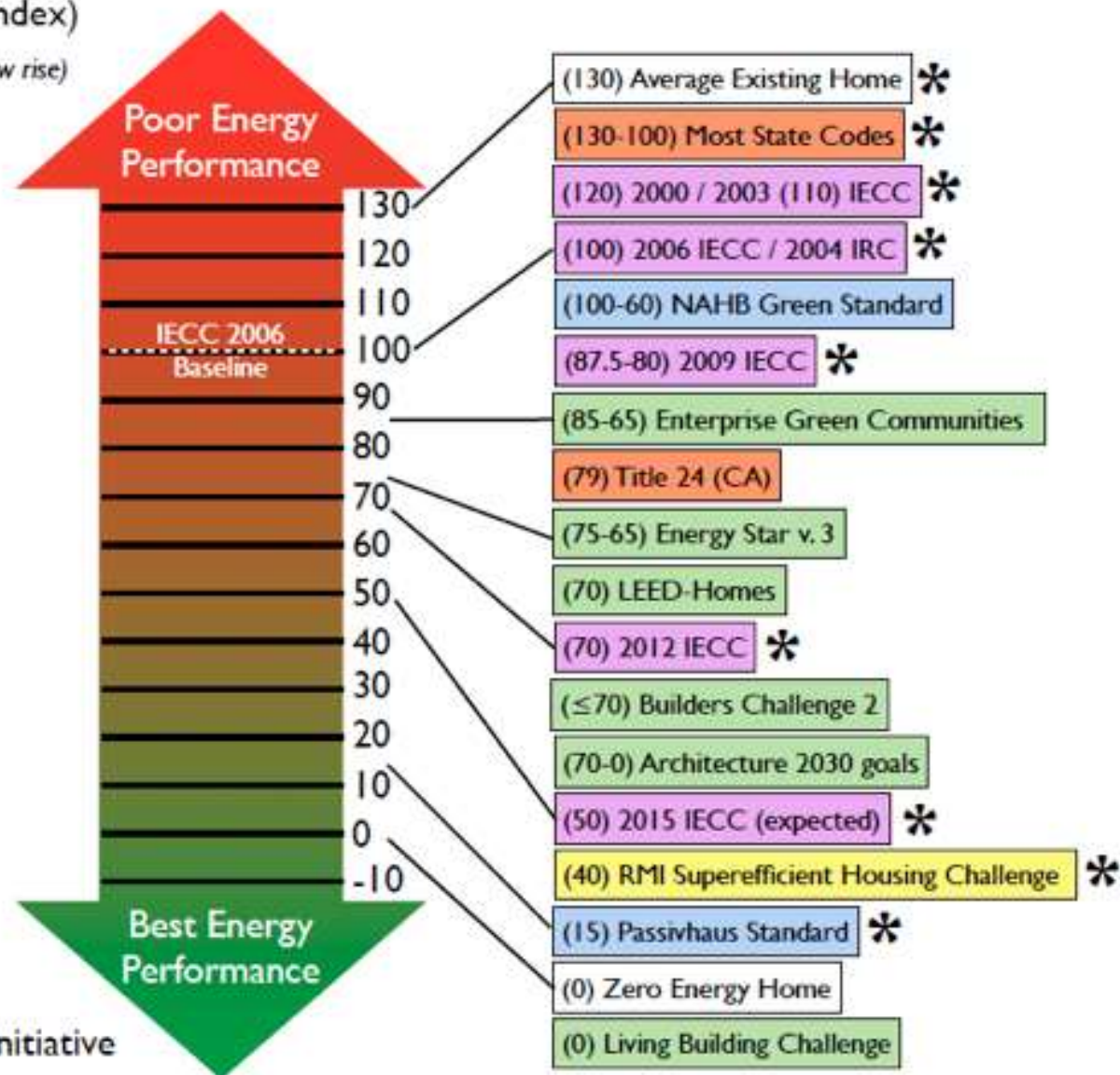
Model Codes

Codes

Standards

Guidelines

* Excludes Photovoltaic Energy



Superefficient Housing Initiative

Air Barrier Testing Results

Project	Chicago's First PH	Adaptation Home	Right Sized	Madison MSH 60-units	Non-PH Spec Home	Non-PH Custom
Year	2012	2014	2015	2016	2015*	2015*
Air Barrier	ICF + SIGA tape	Prosoco R-Guard	Prosoco R-Guard	Tremco	Henry Blueskin / stagger stud	Henry Blueskin / stagger stud
Area (sf)	4,763	4,766	1,854	37,323	2,460	3,753
Volume (cf)	46,023	42,364	16,418	313,052	24,376	40,729
Mid CFM50	384	283	129	1067	517	864
Mid ACH50	0.50	0.40	0.46	0.35	1.27	1.27
Final CFM50						
Final ACH50						
CFM50 Post % improved						
ACH50 Post % improved						

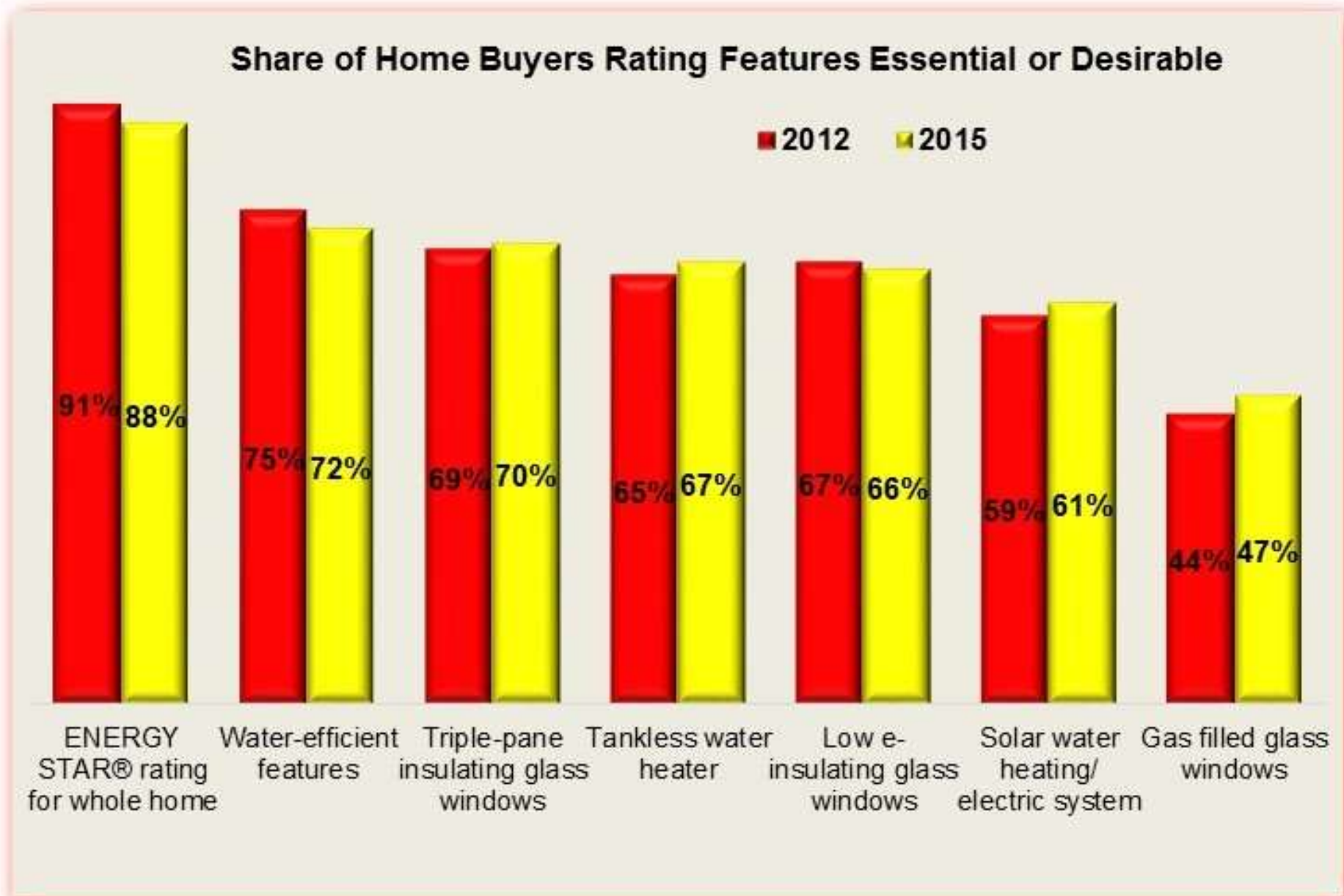
How Builders Address Cost

“I ask my buyer for an extra \$100 a month on their mortgage for a better house, and I give them back \$300 a month in energy savings. That’s not a hard sell.”

Gene Myers,
founder and CEO of Denver–
based **Thrive Home Builders**

“When someone takes our **zero energy** option, that’s actually a little **higher margin** for us than just our base, zero energy ready house.”

Instead of exterior rigid foam, Thrive uses advanced framing techniques to build its double walls, setting two 2x4 frames 2.5 inches apart at the base to create a 9.5-inch wall cavity.



“We build **head-to-head** with any non-zero energy ready house builder at **no extra cost,**”

Steve Brown, president of Plano, Texas-based Carl Franklin Homes

Homes to the Power of **ZERO**



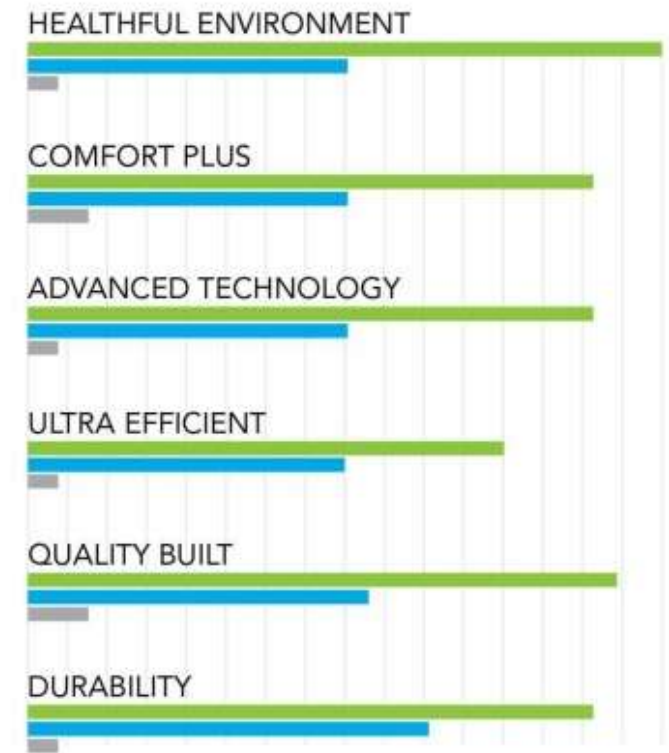
What is the DOE Zero Energy Ready Home™ Label?

It is a Symbol of Excellence for energy savings, comfort, health, quality, and durability met by a select group of leading builders meeting U.S. Department of Energy Guidelines.

What is a Zero Energy Ready Home?

It is a high-performance home so energy efficient, all or most annual energy

A Symbol of Excellence



KEY

- DOE Zero Energy Ready Home
- ENERGY STAR® Certified Home
- Existing Home

This graphic comparison chart demonstrates relative

Passive House Costs

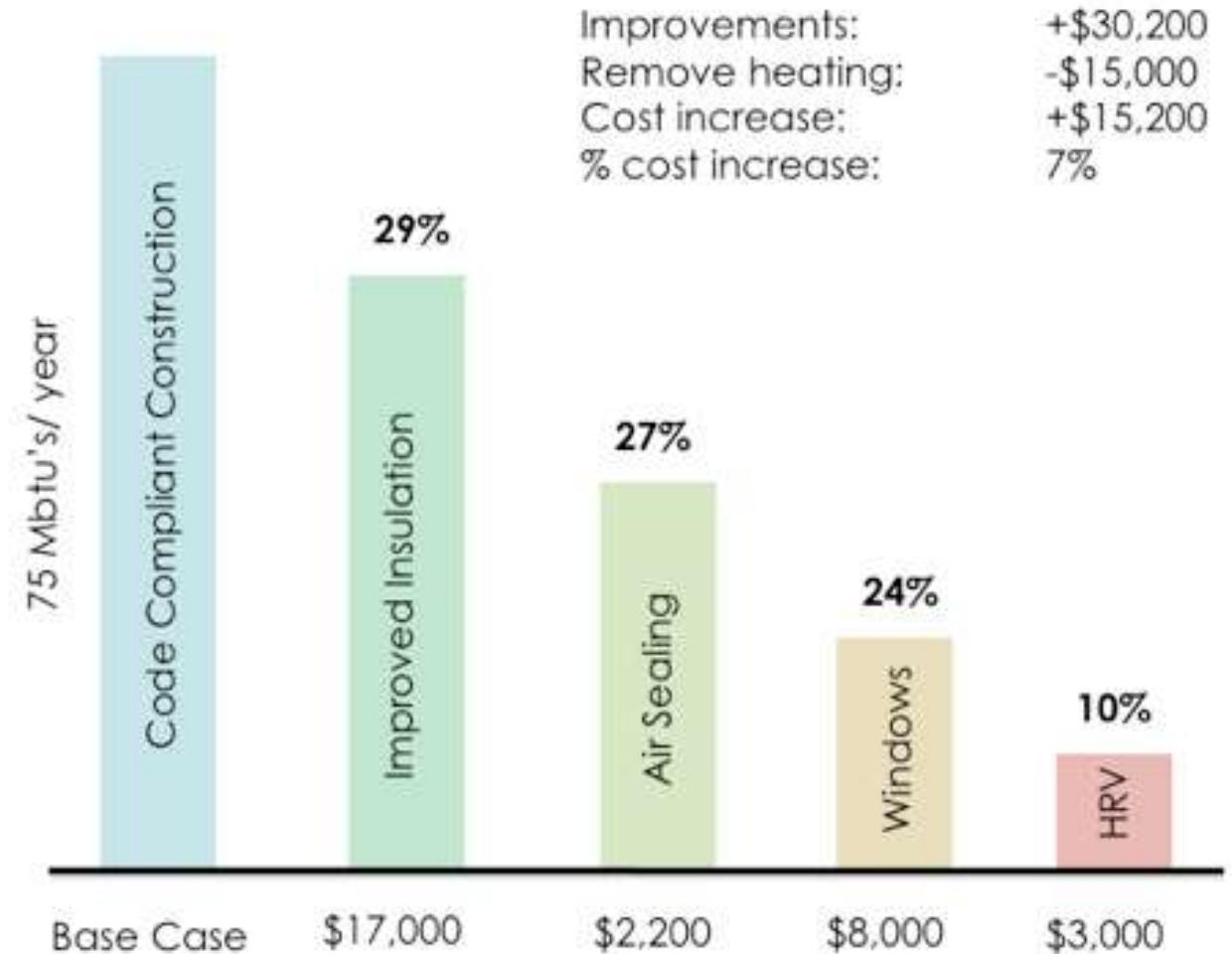
Avg 5%-7% premium to buyer

Reduced warranty costs

Not only premium for energy
but top-quality products

“Cash-flow positive” from Month 1

Passive House performance and cost increase by component based on the GO Home:



Semi-production builder, 25 homes per year, all ENERGY STAR rated with Indoor Air Plus certs

Using continuous insulation, tight ducts, small, mechanicals, and semi-ducted ERVs

Built a LEED Platinum Net Zero Energy (HERS 13) model

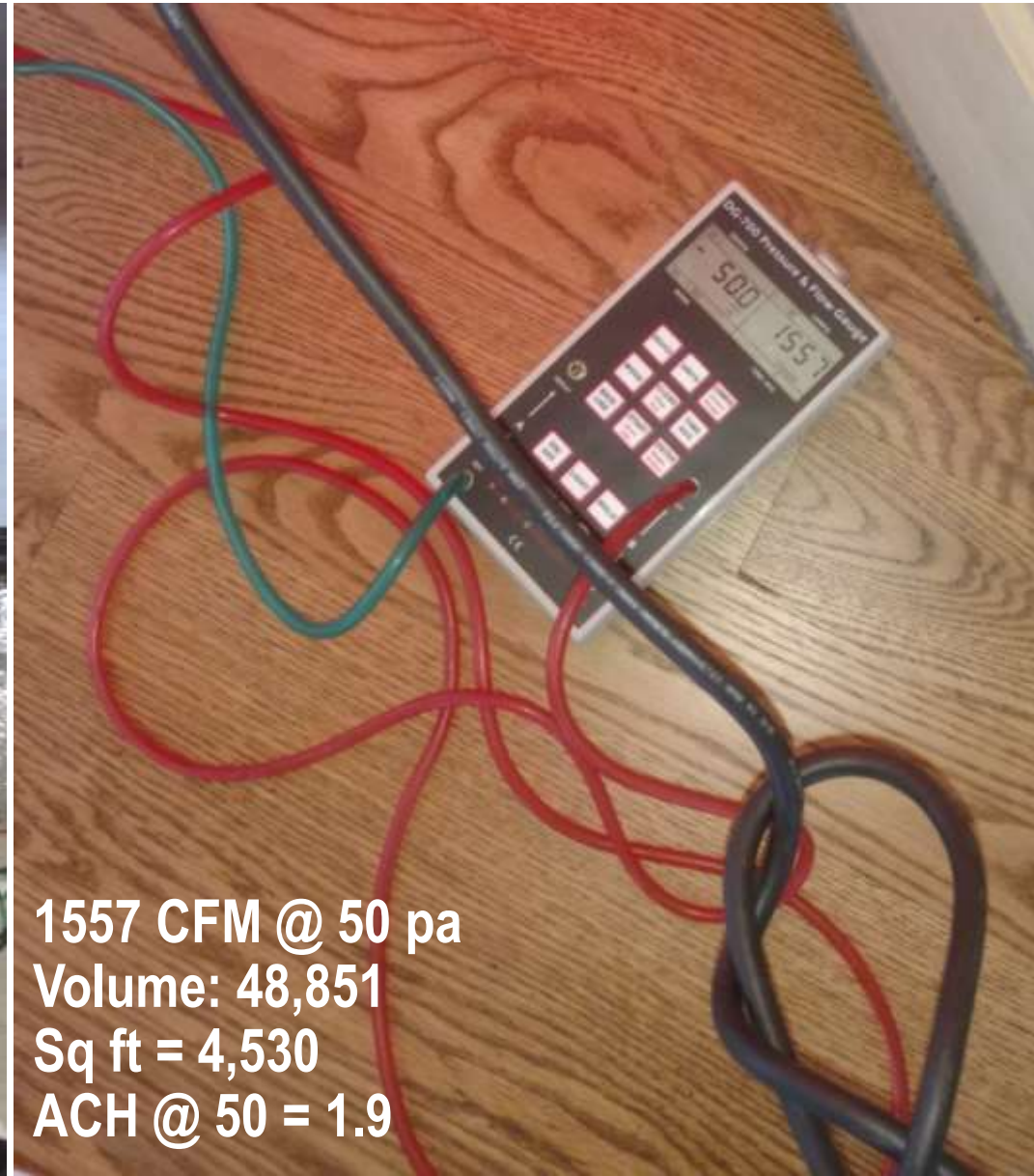












1557 CFM @ 50 pa
Volume: 48,851
Sq ft = 4,530
ACH @ 50 = 1.9

Illinois Green Home Market Research

Overview

As of February 24, 2017, 303 third-party certified homes have closed in the past 24 months.

- Average time on market is 147 days
- 63 homes were located in Chicago

In the last 12 months, 117 of third-party certified homes closed.

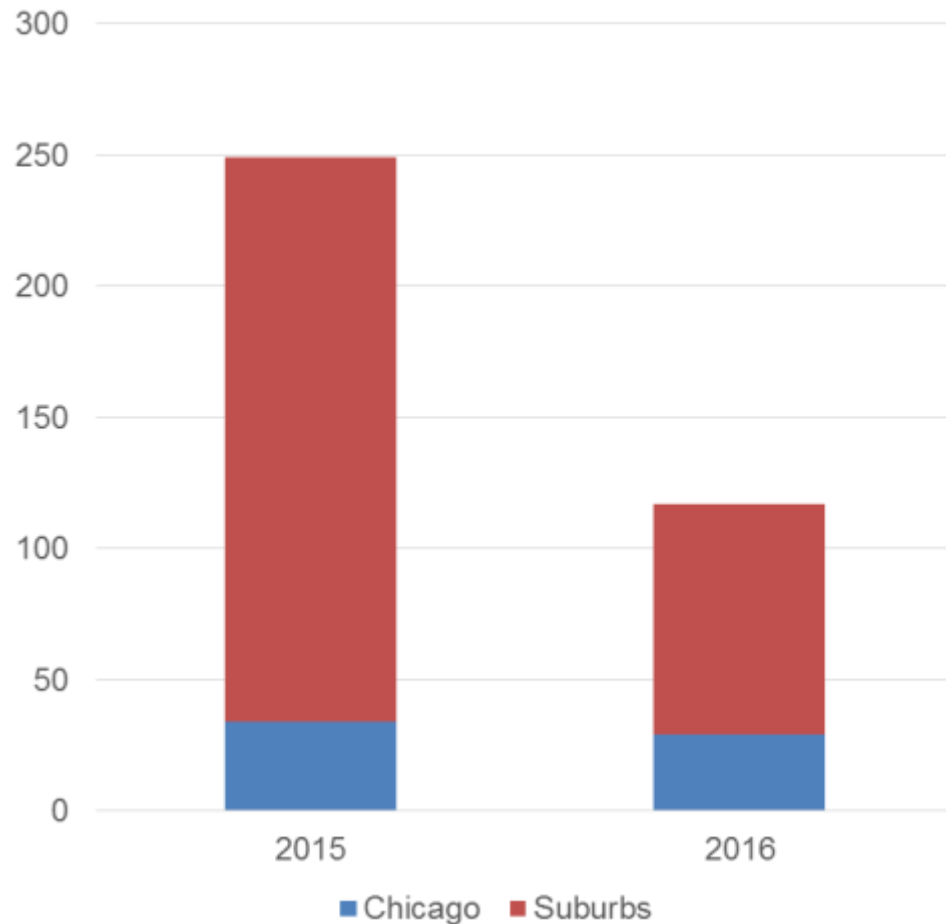
- Average time on market is 139 days
- 29 homes were located in Chicago

Third party certified homes include Energy Star Homes, LEED, NAHB and Chicago Green Homes.

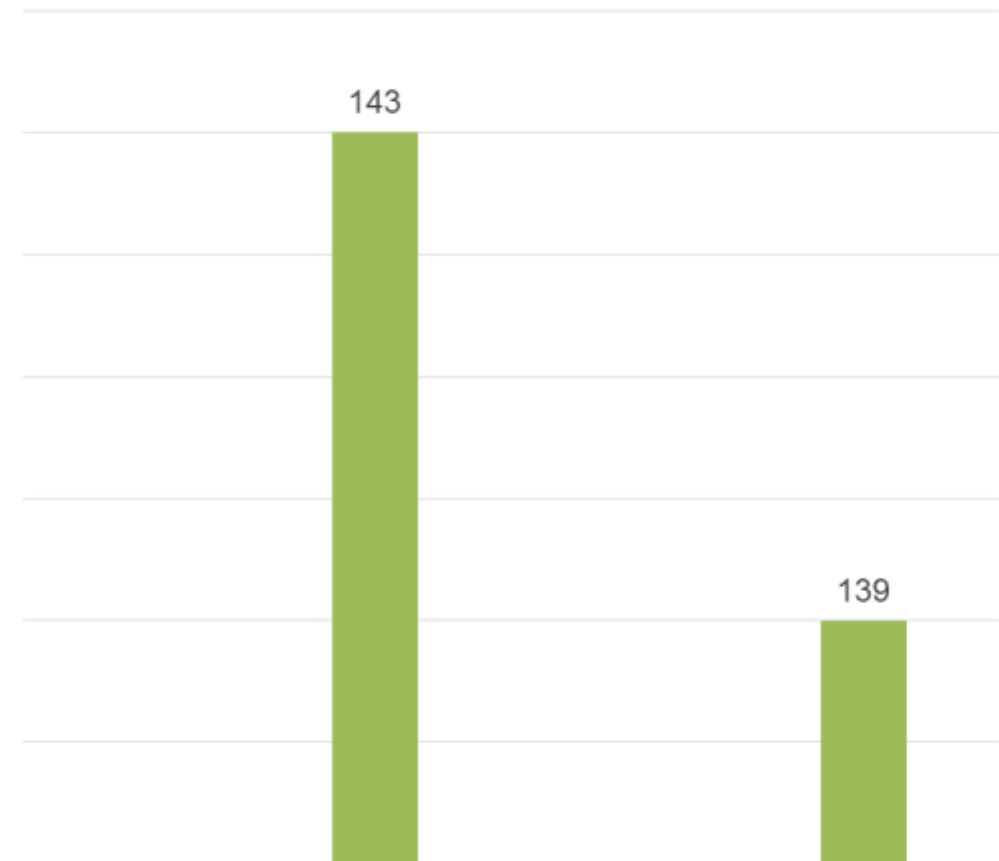
Chicago Green MLS Market Findings

As of Feb 24, 2017

Green Certified Home Sales

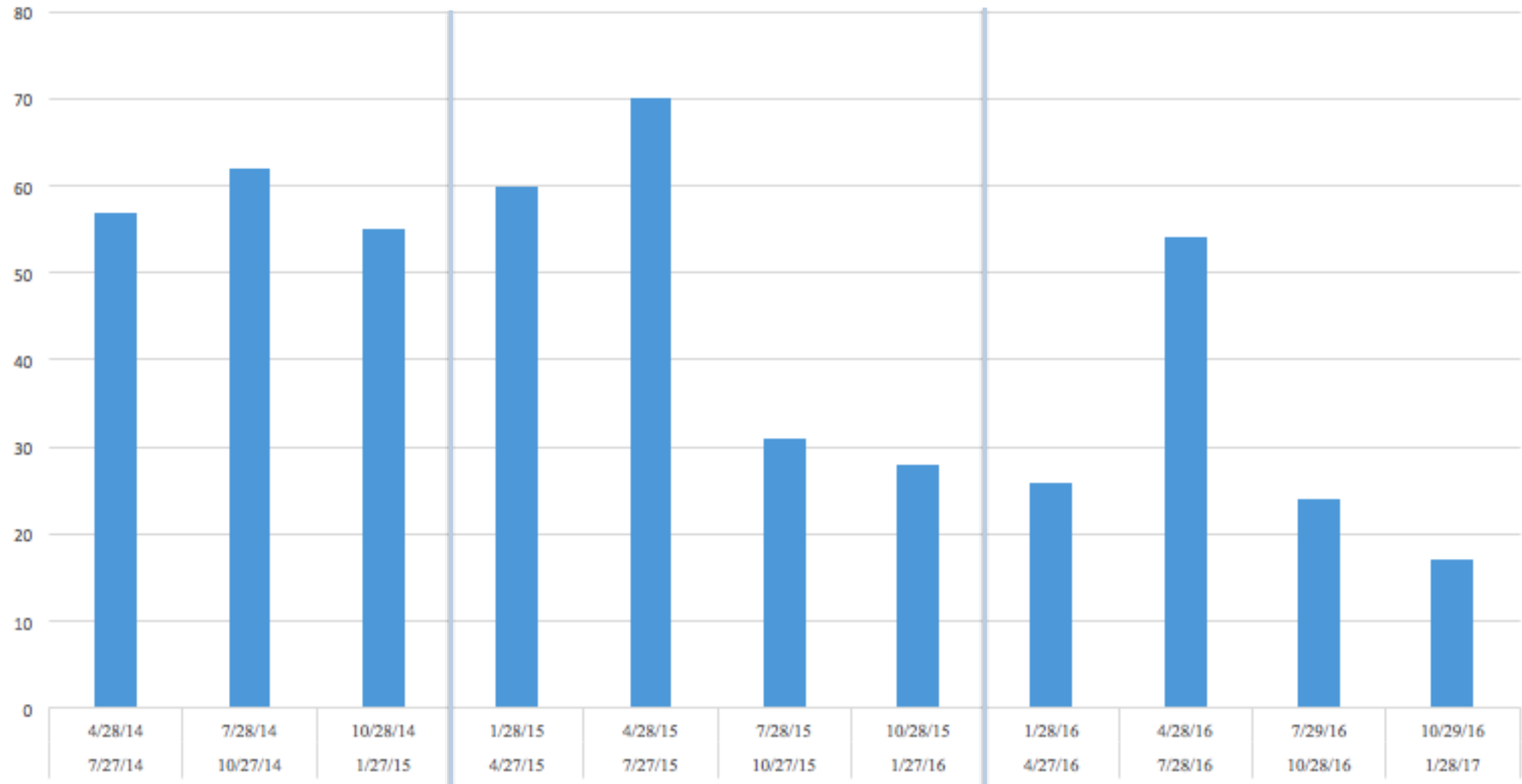


Days On Market



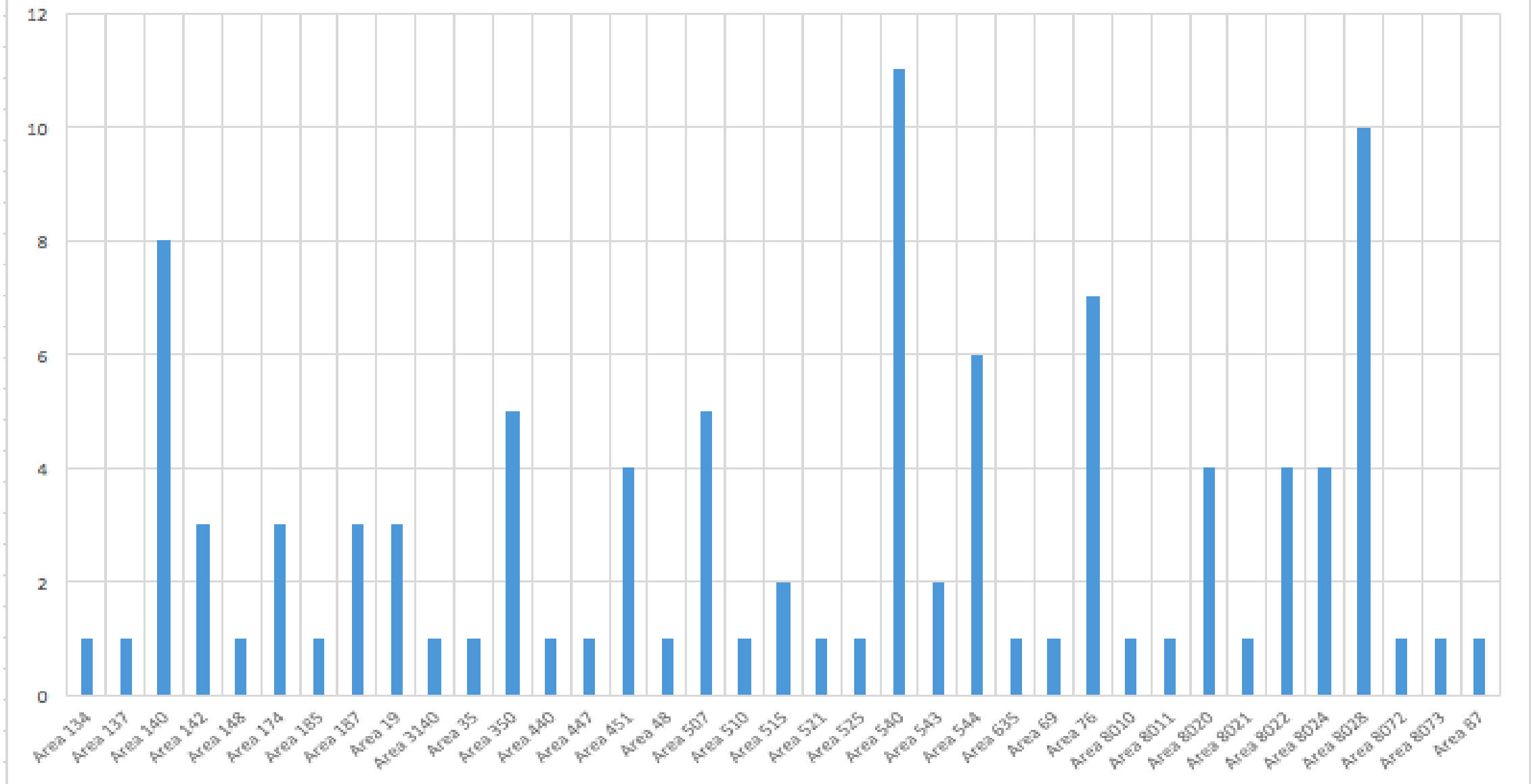
Closed Homes with Green Certification

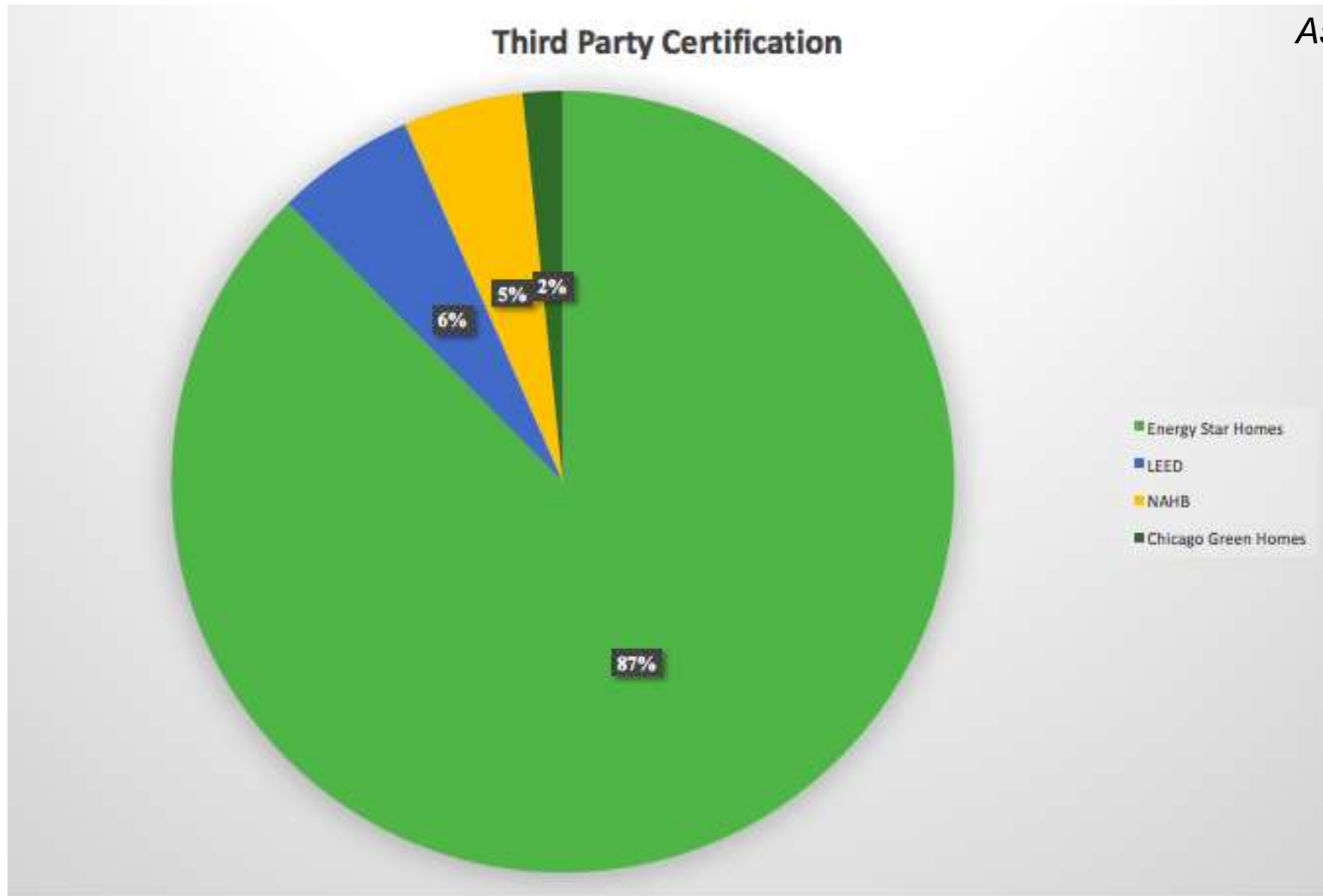
As of Feb 24, 2017



Third Party Certified Homes by Area

As of Feb 24, 2017



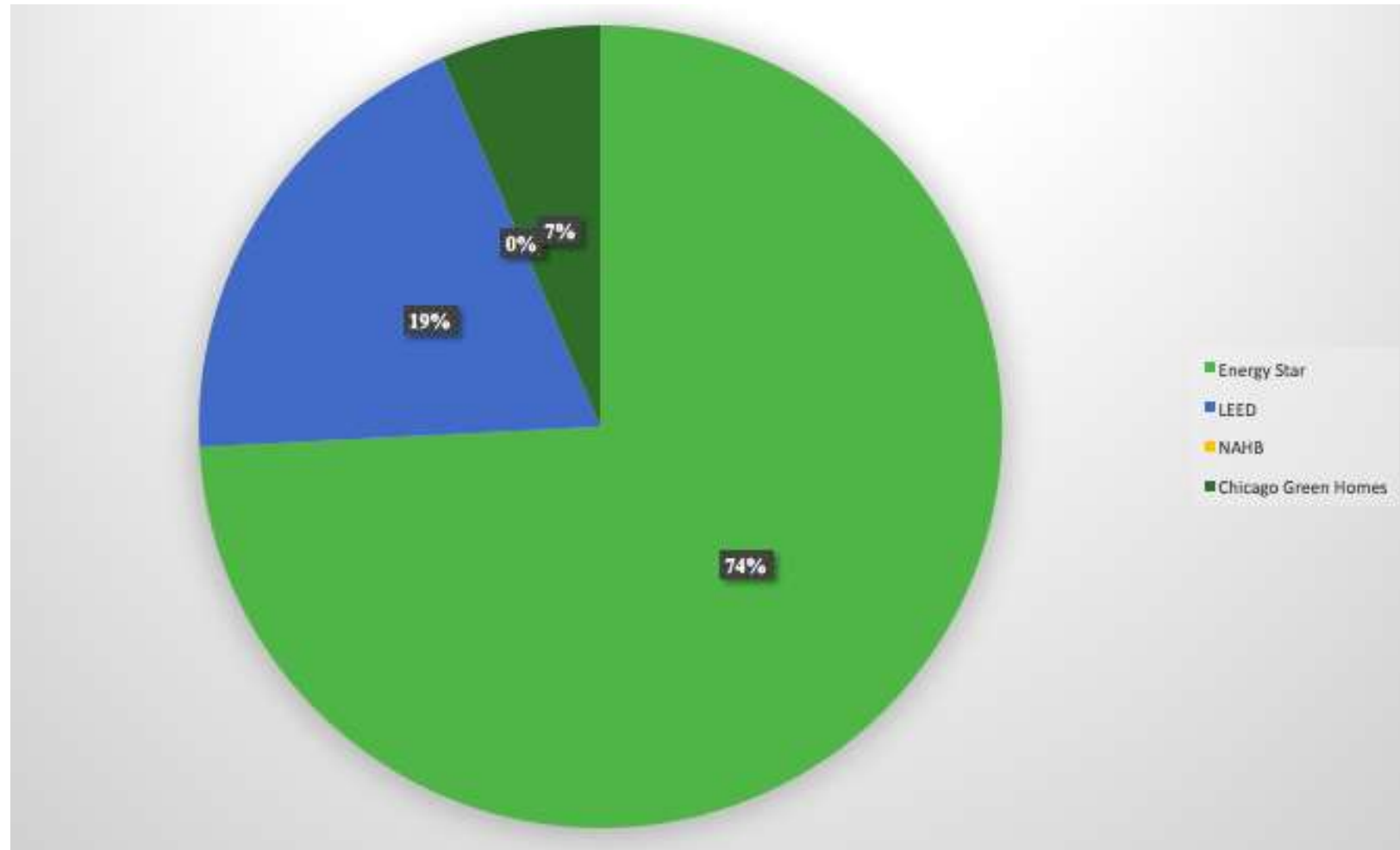


As of Feb 24, 2017

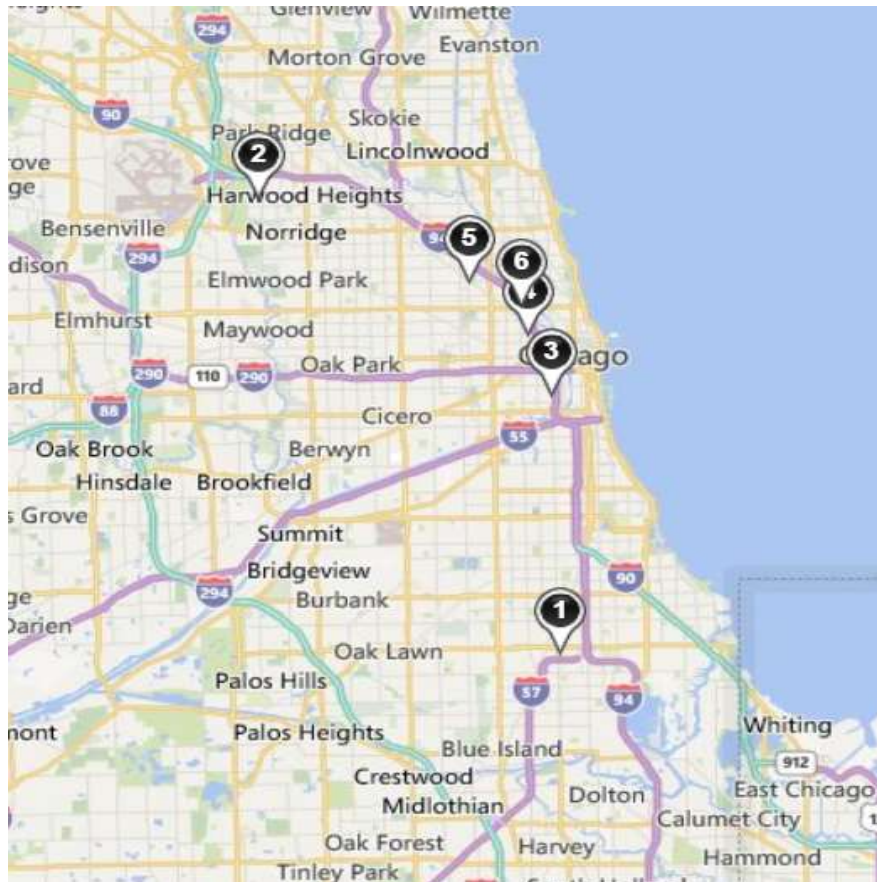
	Number of Homes Closed	Average Market Time (days)	Max Listing Price	Max Selling Price	Average Listing Price	Average Selling Price
Energy Star Homes	121	124	\$1,699,990	\$1,575,000	\$492,684	\$494,745
LEED	10	52	\$1,899,000	\$1,875,000	\$810,510	\$792,080
NAHB	8	96	\$694,900	\$623,000	\$493,516	\$486,479
Chicago Green Homes	2	38	\$385,000	\$370,000	\$342,500	\$330,000
All Certified Homes	133	119	\$1,899,000	\$1,875,000	\$500,588	\$501,835
Certified Homes in Top 5 MRED Areas	48	101	\$1,899,000	\$1,875,000	\$540,879	\$553,014
All Closed Homes	81,684	528	\$4,995,000	\$4,880,000	\$326,806	\$307,388

As of Feb 24, 2017

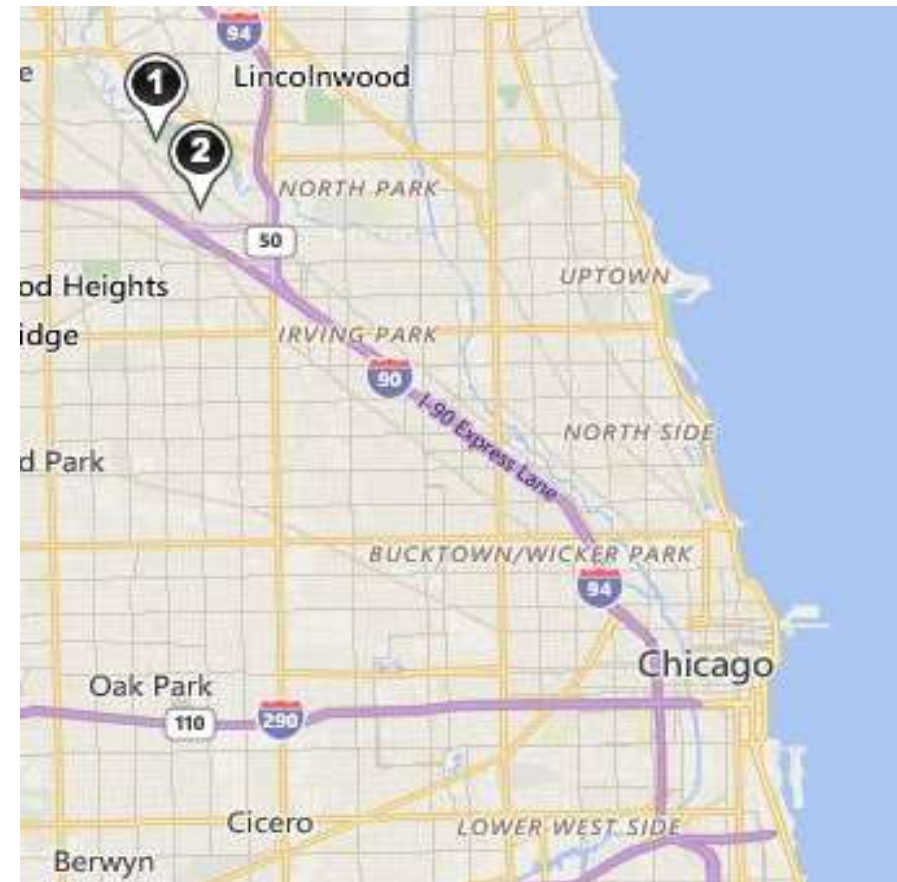
Third Party Certification – City of Chicago



Chicago LEED Homes



Chicago Green Homes



As of Feb 24, 2017

	Number of Homes Closed	Average Market Time (days)	Max Listing Price	Max Selling Price	Average Listing Price	Average Selling Price
Energy Star Homes	29	54	\$1,699,990	\$1,575,000	\$562,499	\$557,442
LEED	8	56	\$1,899,000	\$1,875,000	\$961,912	\$938,875
NAHB	-	-	-	-	-	-
Chicago Green Homes	2	38	\$385,000	\$370,000	\$342,500	\$330,000
All Chicago Certified Homes	36	55	\$1,899,000	\$1,875,000	\$597,469	\$591,439
Certified Homes in Top 5 MRED Areas	48	101	\$1,899,000	\$1,875,000	\$540,879	\$553,014
All Chicago Closed Homes	11,147	93	\$3,499,000	\$3,280,000	\$349,572	\$338,916

As of Feb 24, 2017

Comparison of Top 5 MRED Areas

Area	Number of Homes Closed	Average Market Time (days)	Max Listing Price	Max Selling Price	Average Listing Price	Average Selling Price
540	12	101	\$1,047,777	\$1,007,000	\$511,716	\$499,881
8024	9	45	\$1,899,000	\$1,875,000	\$852,544	\$848,000
8028	11	35	\$452,000	\$455,000	\$438,000	\$438,803
76	8	200	\$680,000	\$964,349	\$549,500	\$645,317
451	8	159	\$419,900	\$410,000	\$366,842	\$365,593

Green Features

As of Feb 24, 2017

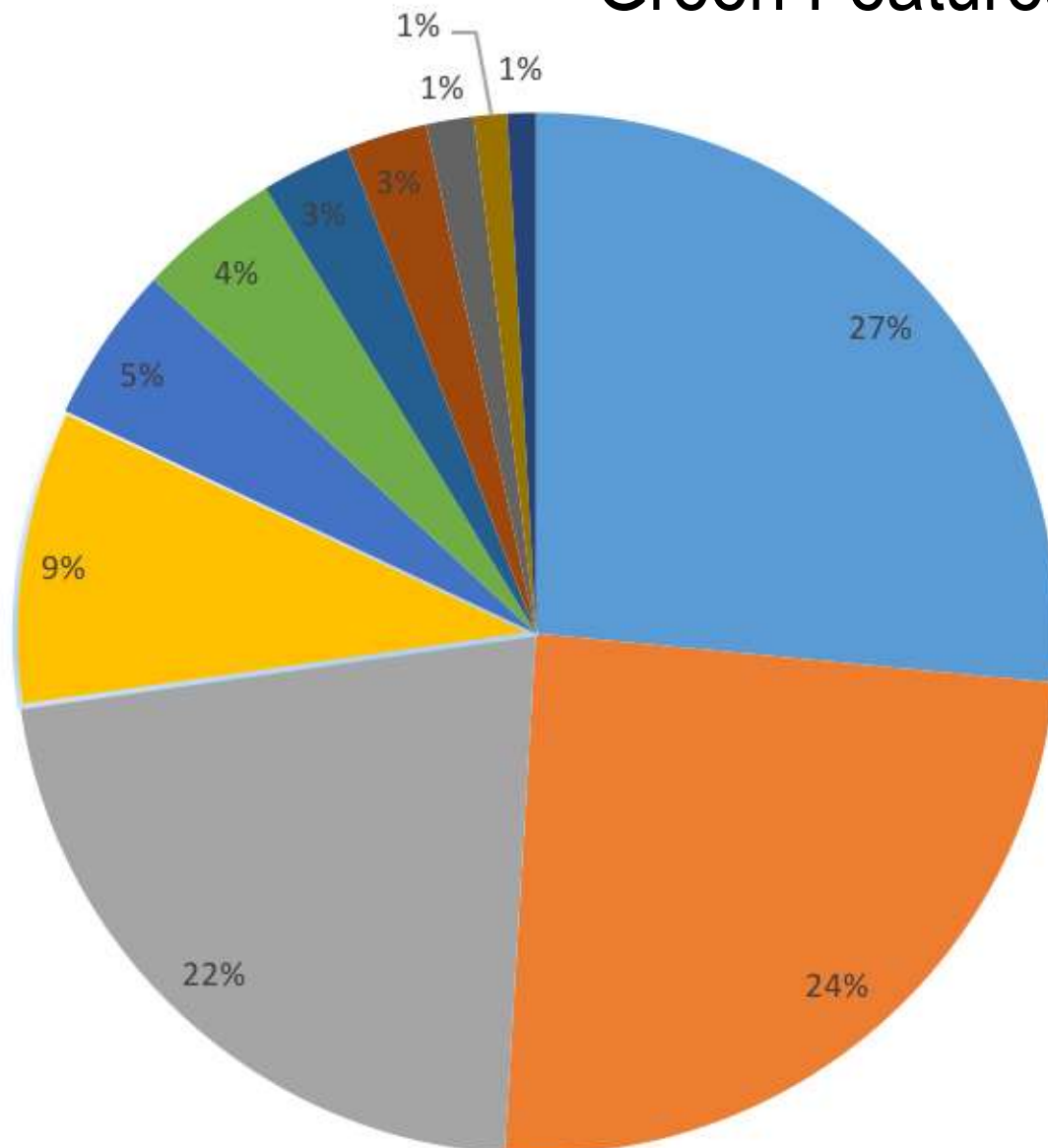
Most Popular:

Tankless H2O

HP Toilet

HP Fixtures

Enhanced Air



- Tankless Hot Water Heater
- Low Flow Commode
- Low Flow Fixtures
- Enhanced Air Filtration
- Rainwater Collection System
- Geothermal Heating/Cooling System
- Native/Drought Resistant Landscaping
- Photovoltaic
- Solar Hot Water
- Pre-Wired for PV/Solar
- Green Roof
- Green Feature

Building a Neighborhood of Data

Features w/ Highest Sale Price:

Pre-Wired for Solar

Solar Hot Water

GSHP

Enhanced Air Filtration / ERV

Green Roof

	Homes Closed	Market Time (days)	Price	Price	Listing Price	Selling Price
Photovoltaic/Solar System	18	213	\$1,047,777	\$1,007,000	\$384,323	\$376,118
Pre-Wired for PV/Solar	7	183	\$1,699,000	\$1,575,000	\$789,975	\$755,218
Solar Hot Water	10	62	\$1,899,000	\$1,875,000	\$784,340	\$764,680
Geothermal Heating/Cooling System	30	153	\$1,899,000	\$1,875,000	\$664,820	\$639,466
Tankless Hot Water Heater	178	116	\$3,999,000	\$3,700,000	\$511,325	\$495,103
Enhanced Air Filtration	61	150	\$3,975,000	\$3,905,274	\$773,092	\$750,693
Low Flow Commode	164	100	\$2,795,000	\$2,750,000	\$489,425	\$481,244
Low Flow Fixtures	145	100	\$2,999,999	\$2,802,500	\$556,834	\$549,914
Native/Drought Resistant Landscaping	19	130	\$995,000	\$995,000	\$423,342	\$408,578
Rainwater Collection System	34	48	\$1,695,000	\$1,725,500	\$446,327	\$437,681
Green Roof	6	110	\$1,899,000	\$1,875,000	\$1,012,133	\$1,006,416
All Homes with Green Features	440	119	\$3,999,000	\$3,905,274	\$510,529	\$497,615
All Closed Homes	81,684	528	\$4,995,000	\$4880,000	\$326,806	\$307,388

Chicago – City
59 Homes

Most Popular:

Tankless H2O

HP Toilet

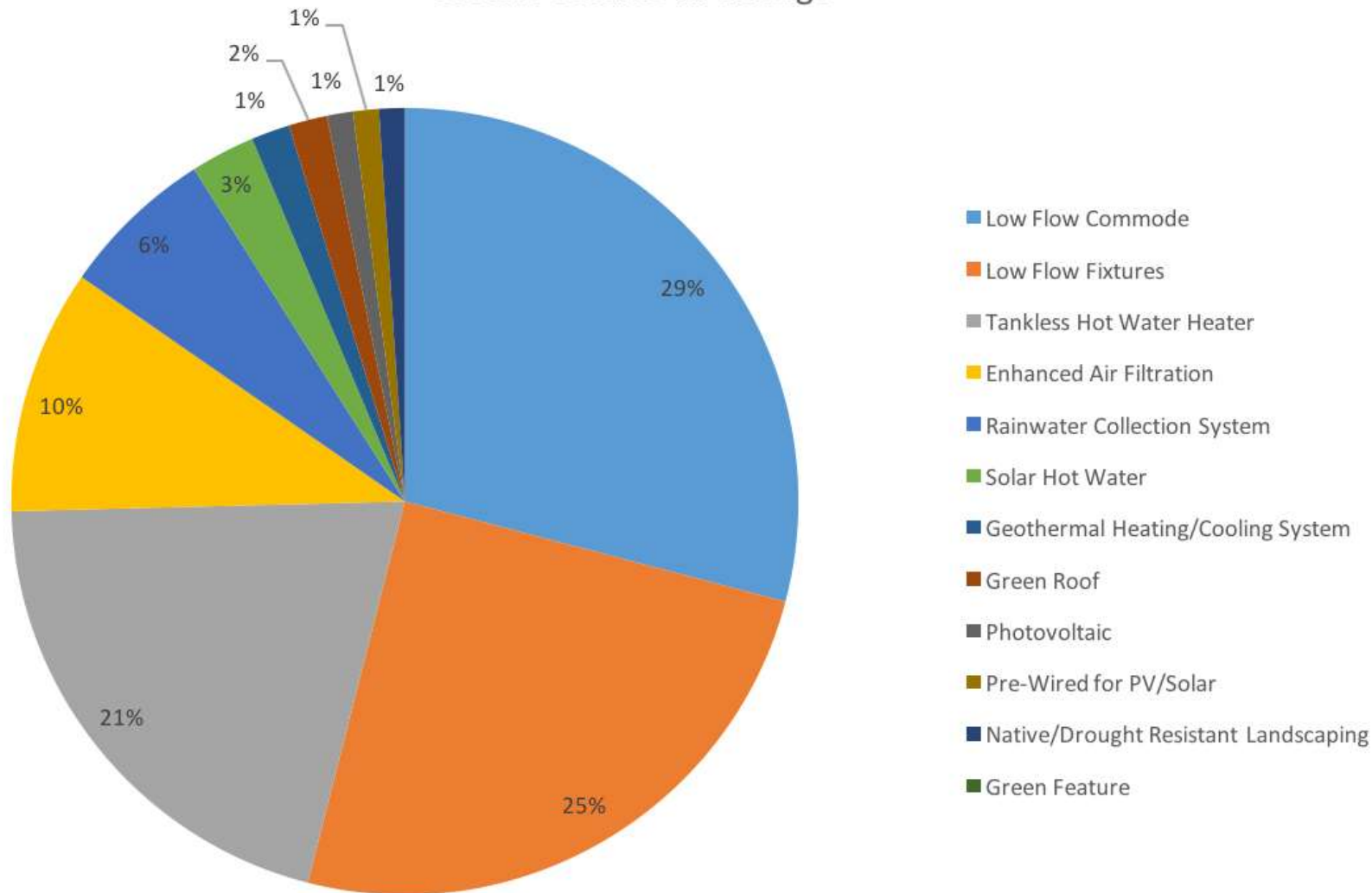
HP Fixtures

Enhanced Air

Rainwater Collection

Green Features in Chicago

As of Feb 24, 2017



Chicago – Suburbs
353 Homes

As of Feb 24, 2017

Most Popular:

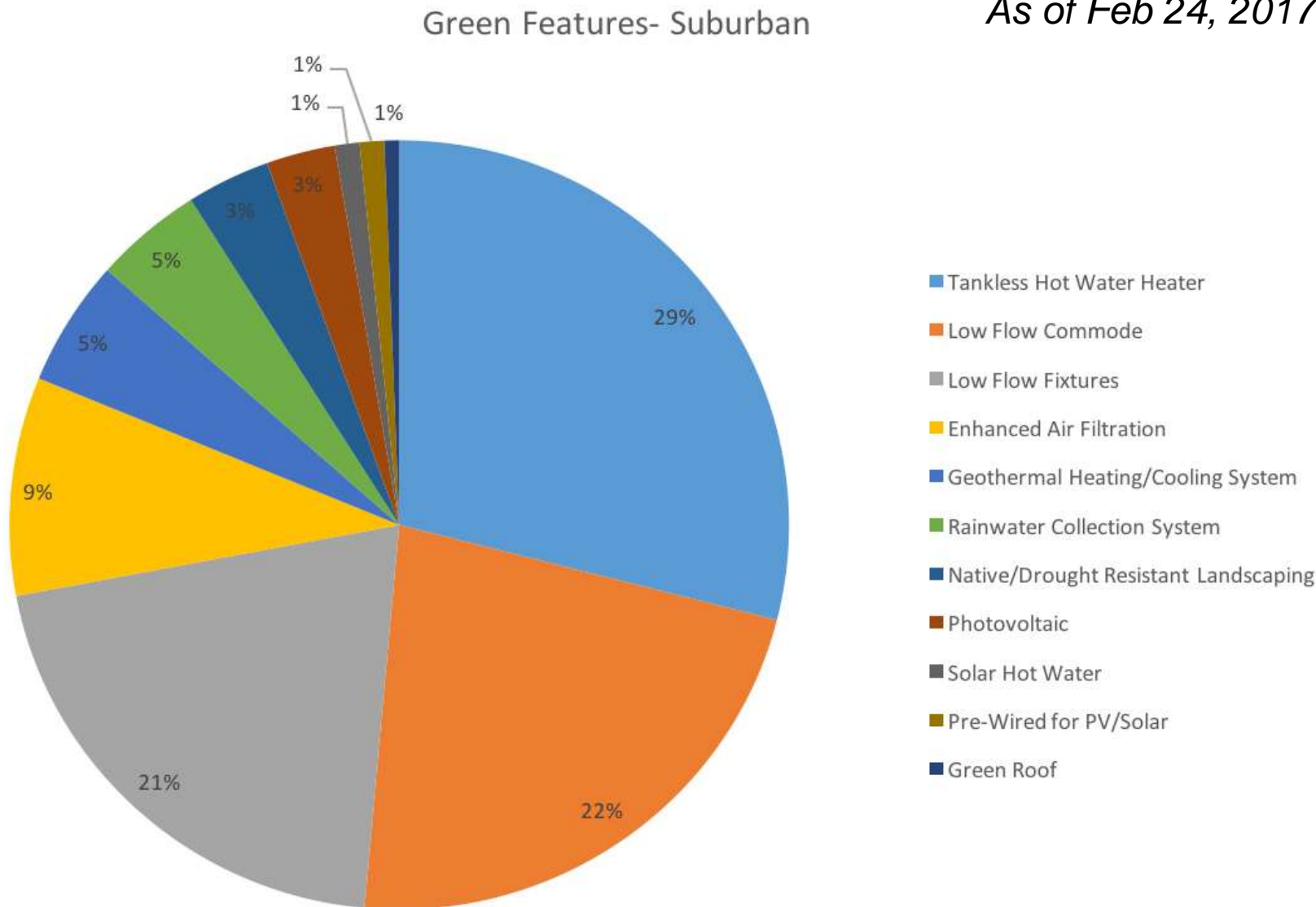
Tankless H2O

HP Toilet

HP Fixtures

Enhanced Air

Geothermal GSHP



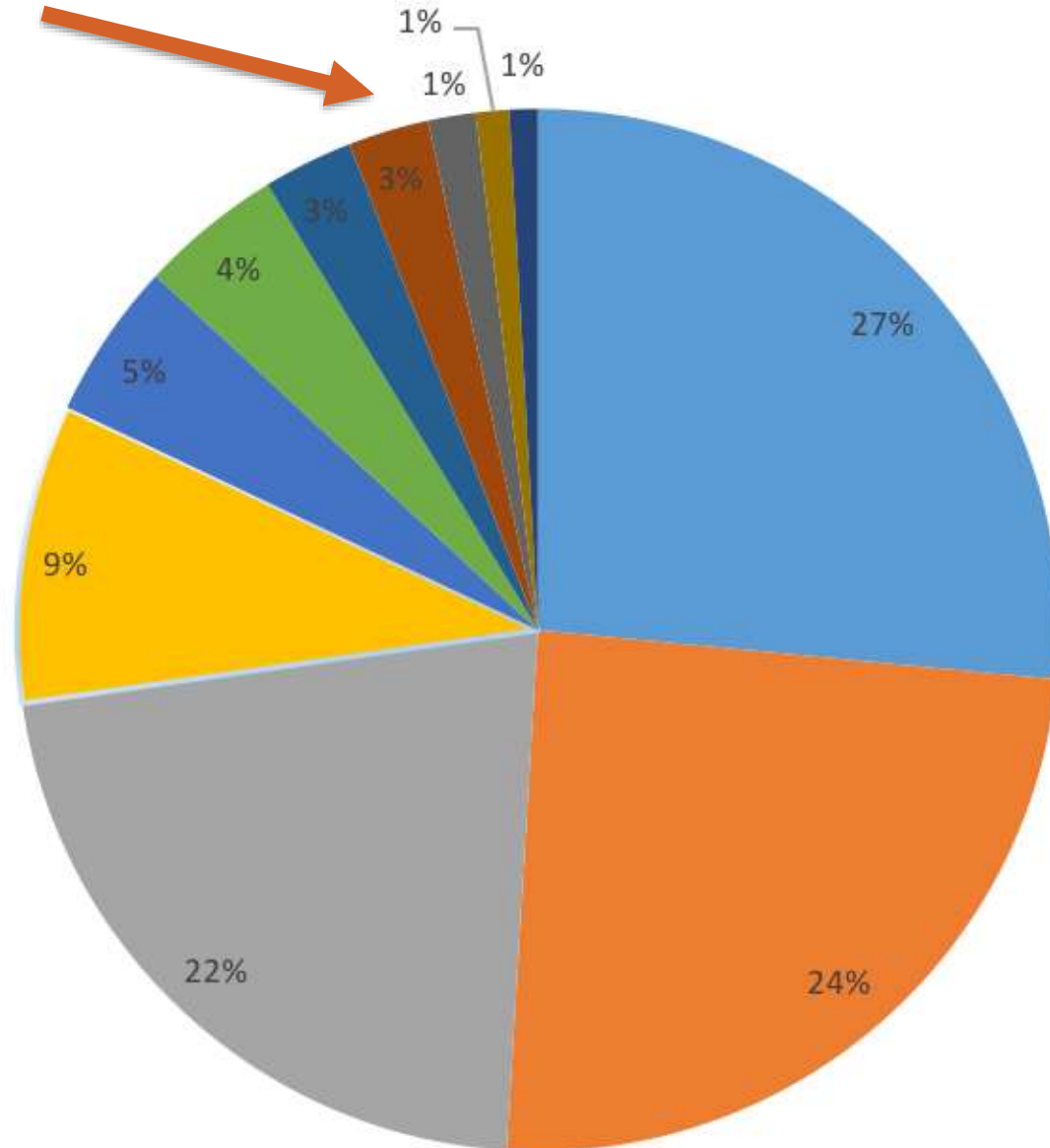
Green Features – City + Suburbs

LEAST Popular:

Solar Hot Water

Solar Ready

Green Roof



- Tankless Hot Water Heater
- Low Flow Commode
- Low Flow Fixtures
- Enhanced Air Filtration
- Rainwater Collection System
- Geothermal Heating/Cooling System
- Native/Drought Resistant Landscaping
- Photovoltaic
- Solar Hot Water
- Pre-Wired for PV/Solar
- Green Roof
- Green Feature

Green Feature Trends

As of Feb 24, 2017

- Fancy **mechanicals** have a higher selling price
 - Pre-wired for PV/Solar, Solar Hot Water, Geothermal Heating/Cooling System, Enhanced Air Filtration, and Green Roofs
- The most popular features, for all areas, are **water-related**.
(low flow fixtures and tankless water heaters).
- Overall, homes with **at least one green feature** have a higher average selling price and spend less time on the market.
 - Average sale price ~**1.6 times higher** than homes without green features.
 - In Chicago city, average sale price ~ **2.3 times higher** than homes without green features.

What about HERS?

As of Feb 24, 2017

Of the homes that have closed in the past 12 months, 337 had a listed HERS Index Score between 0-100. 91 of these homes have closed within the past 3 months.

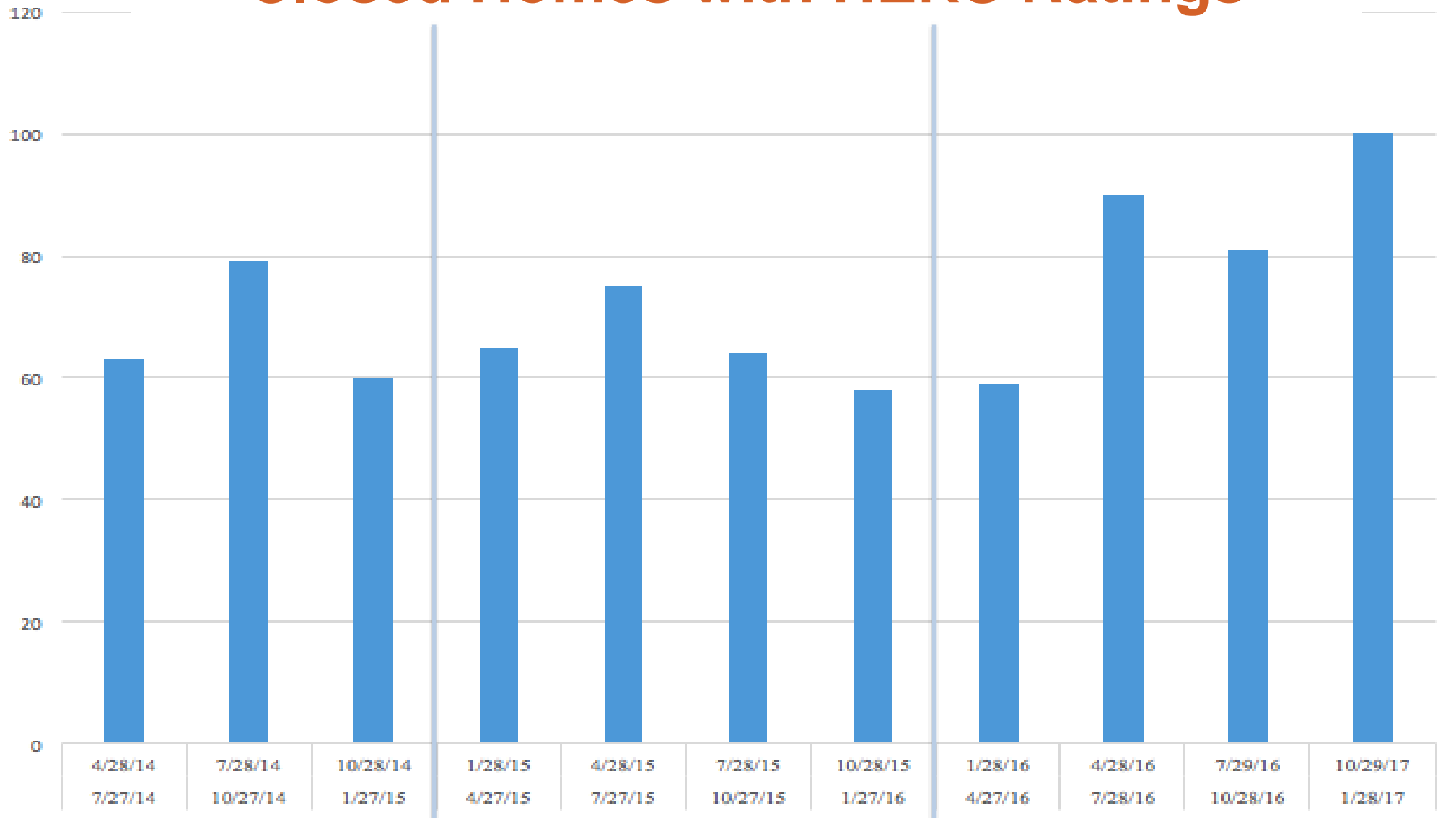
- Average time on market: 127 days
- Average list price: \$371,528
- Average sale price: \$372,741

There 38 homes that have a score between 0-50.

- Average time on market: 212 days
- Average list price: \$529,578
- Average sale price: \$540,749

Closed Homes with HERS Ratings

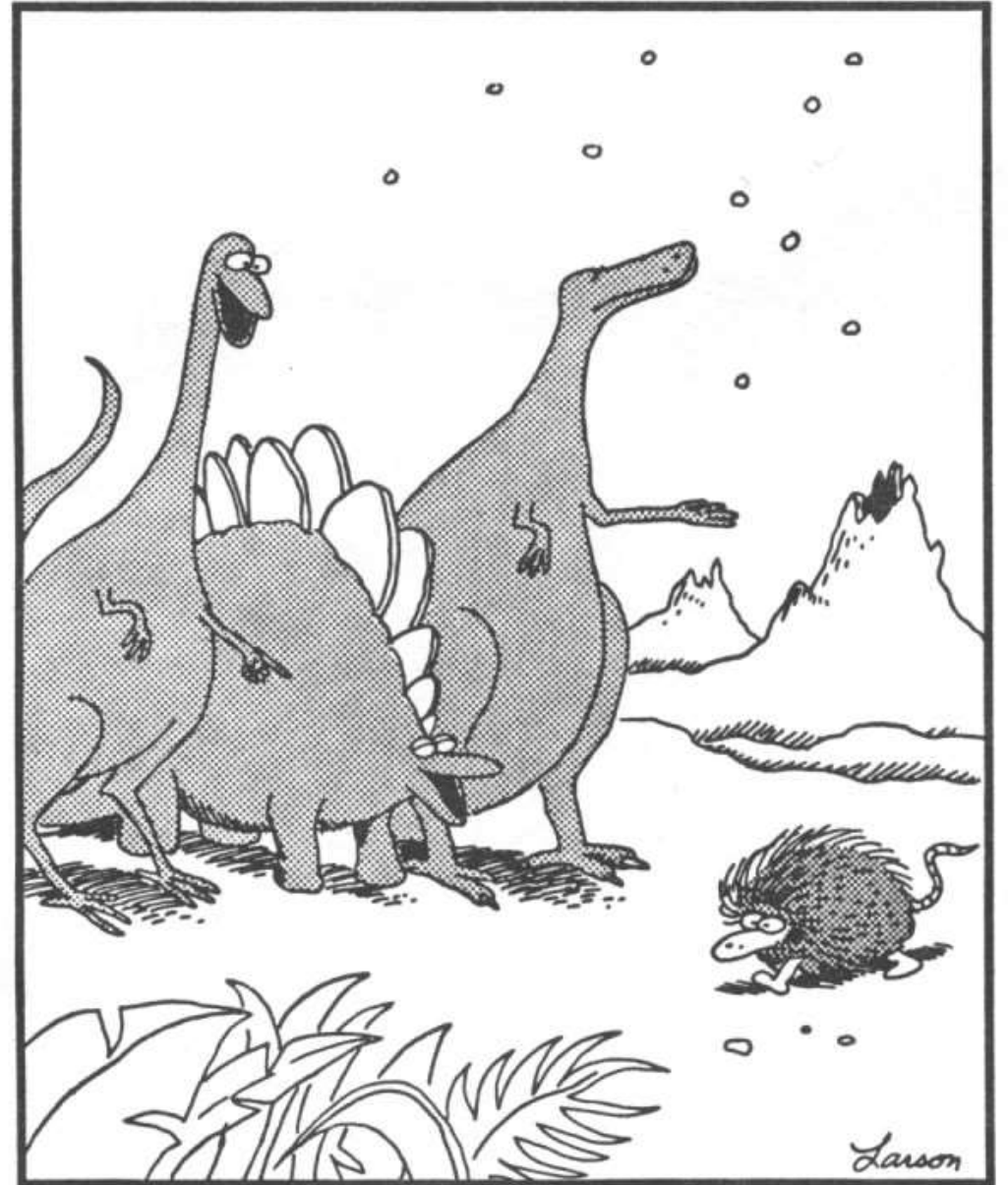
As of Feb 24, 2017



Moving Forward

Continued research on the market.

Other market studies worth looking at?



Let's Connect.

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Michael Hobbs, MAI, SRA

PahRoo Appraisal

Twitter: @PahRoo

hobbs@pahroo.com

Facebook.com/PahRooAppraisal

Resources

“Residential Green Valuation Tools”
2014, Appraisal Institute publication

Green Real Estate Toolkit:
www.EcoAchievers.com/Toolkit