
The Green Economics of Residential Development in Philadelphia

1/18/12

**Presentation to “To Green or Not to Green”
BIA Conference**

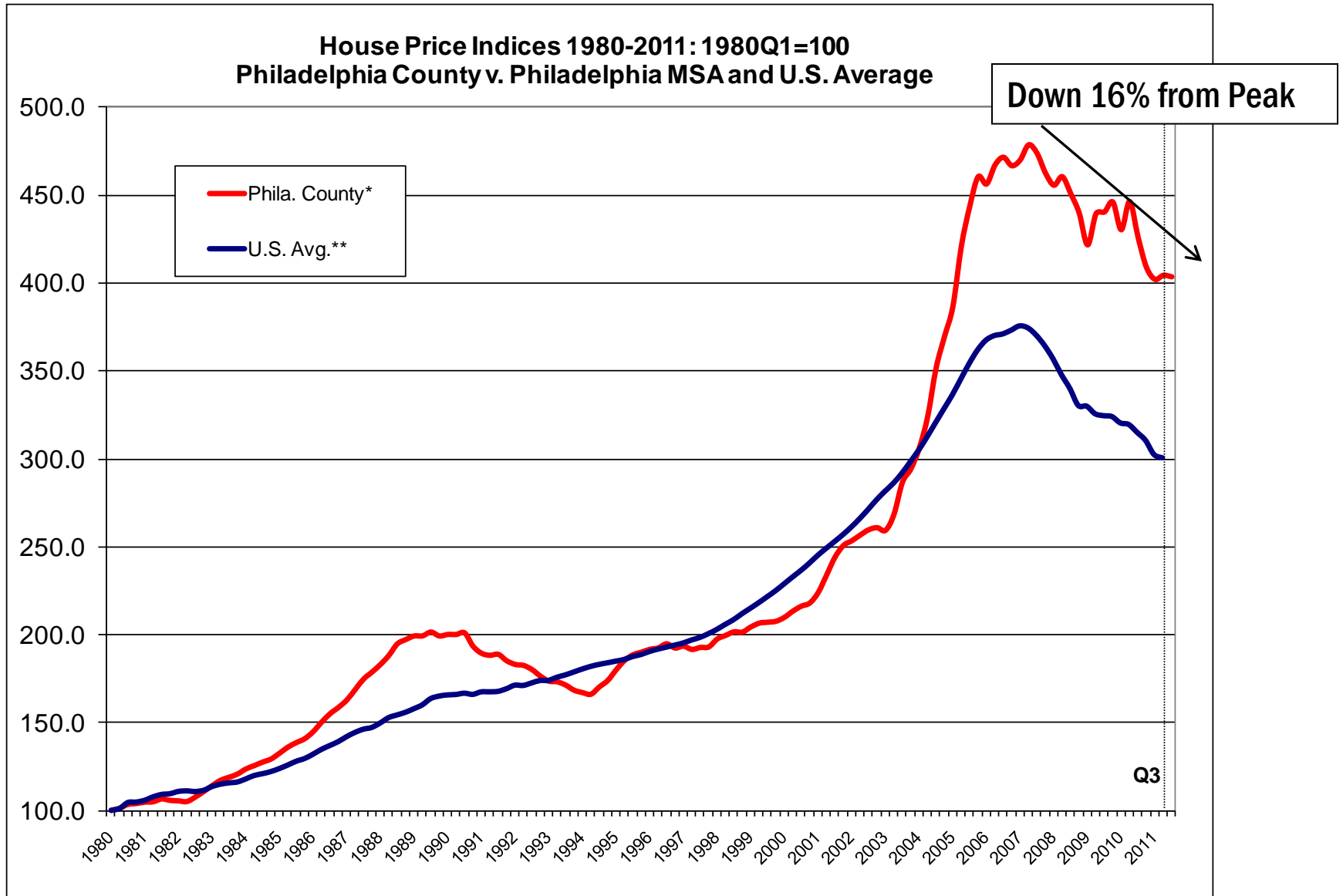
Kevin C. Gillen, PhD
Econsult V.P.
Research Fellow, U. Penn.
gillen@econsult.com

Brian Uher, MS, MSE, LEED AP, CPHC
Chief Technology Officer
ECoRe Living, LLC
brian@ecoreliving.com

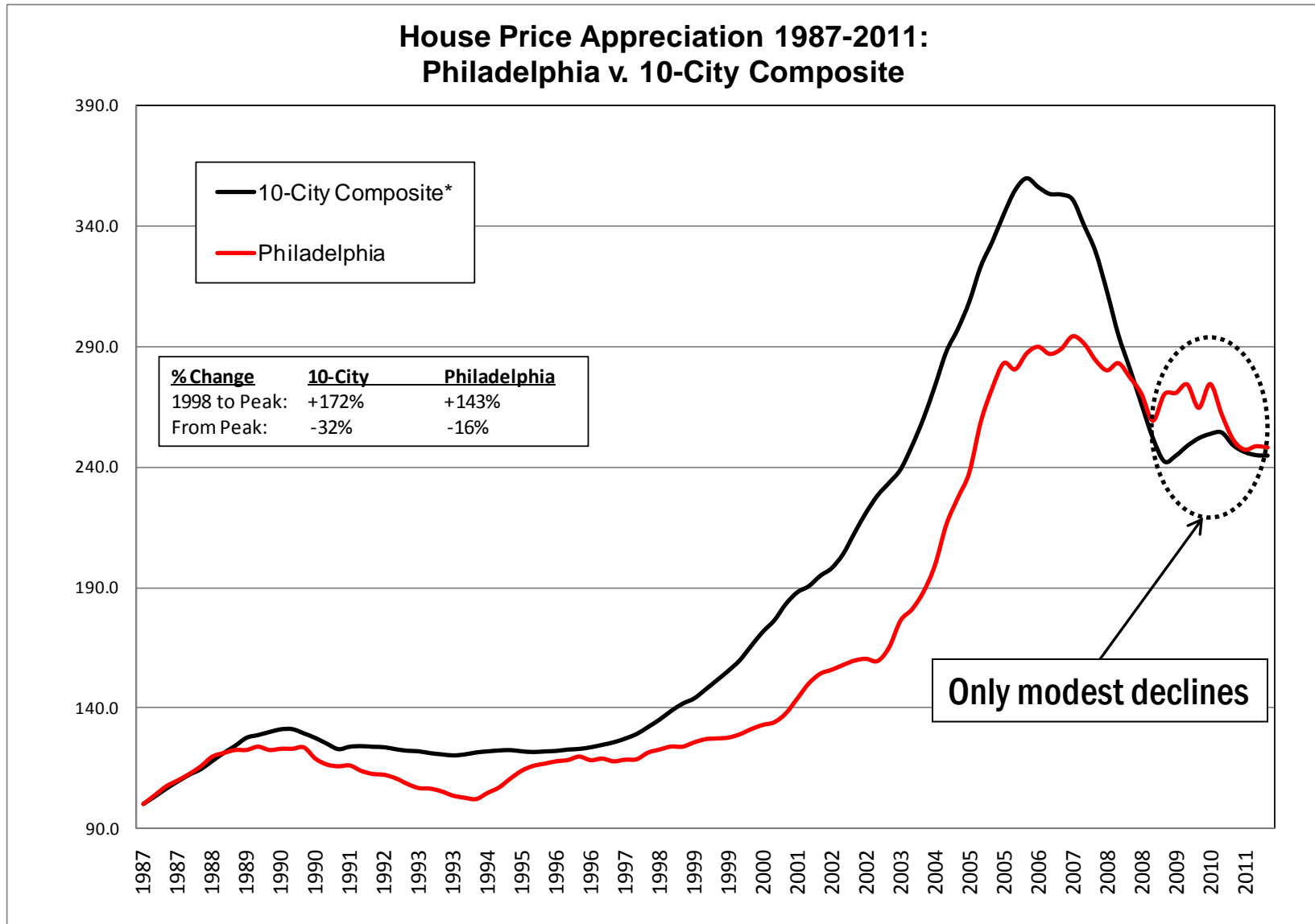
Outline of Presentation

- **Overview of current housing market**
- **Overview of the economics of “green” development**
- **Case Study of a representative apartment building in Philadelphia**
- **Summary and Outlook for the future**

- After several years of consecutive declines, Philadelphia's house prices have shown some recent signs of stabilization.

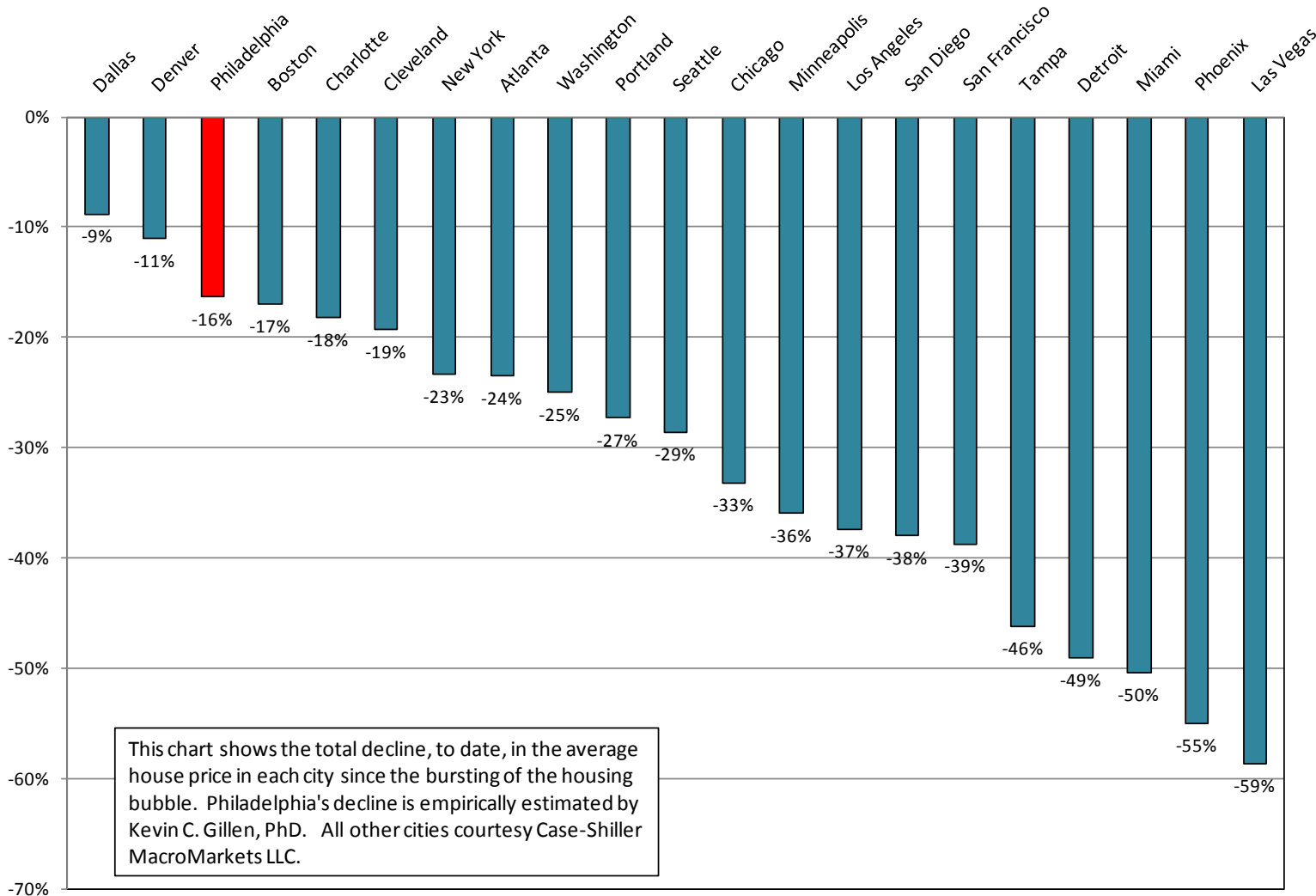


- But, Philadelphia's house price declines have been significantly smaller than in most other U.S. cities :

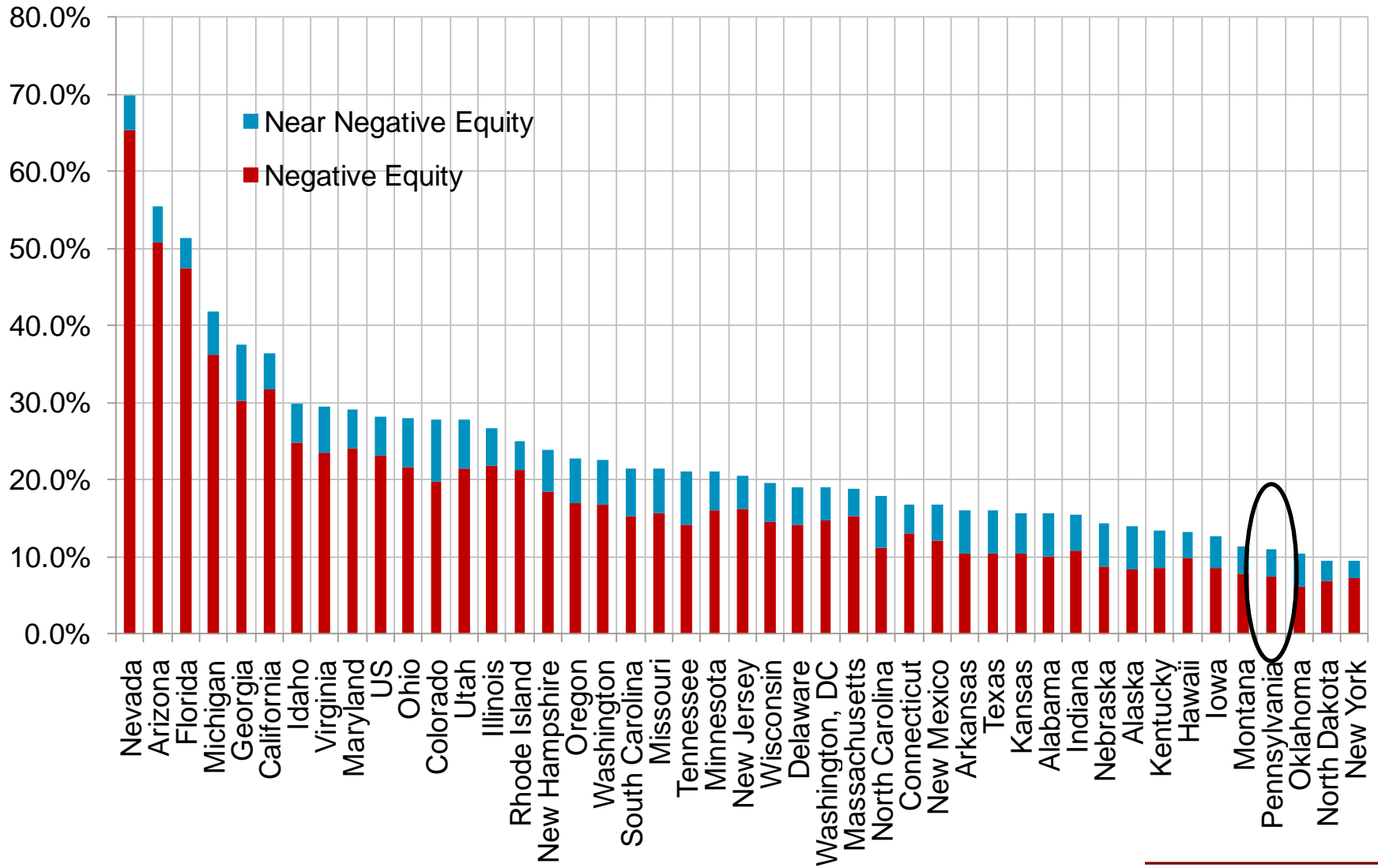


- And, our house values still continue to hold up much better than most other large U.S. cities:

Cumulative %Decline in House Prices from Peak

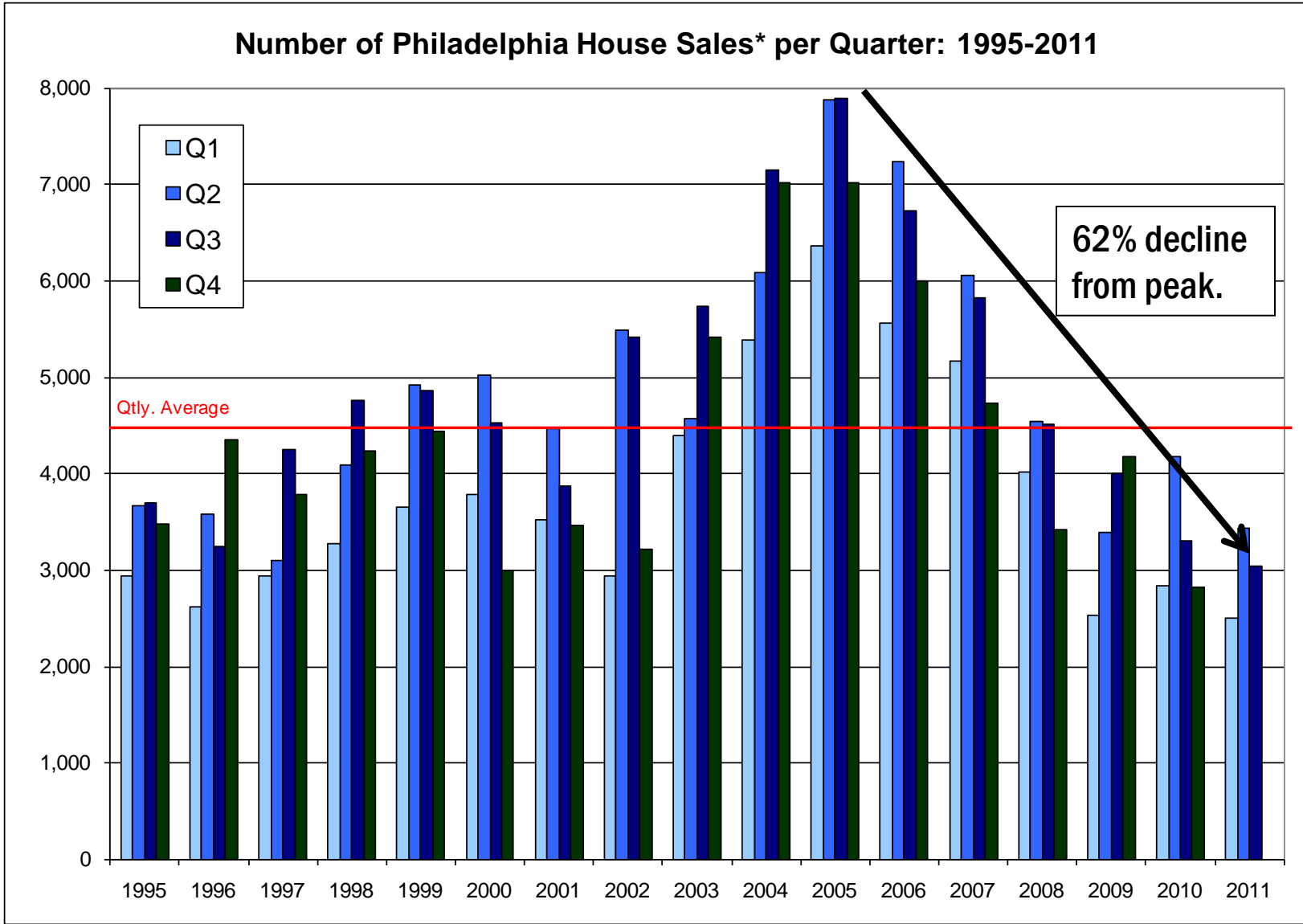


- Because price declines have been relatively modest, only a small percentage of our homeowners are “underwater”:



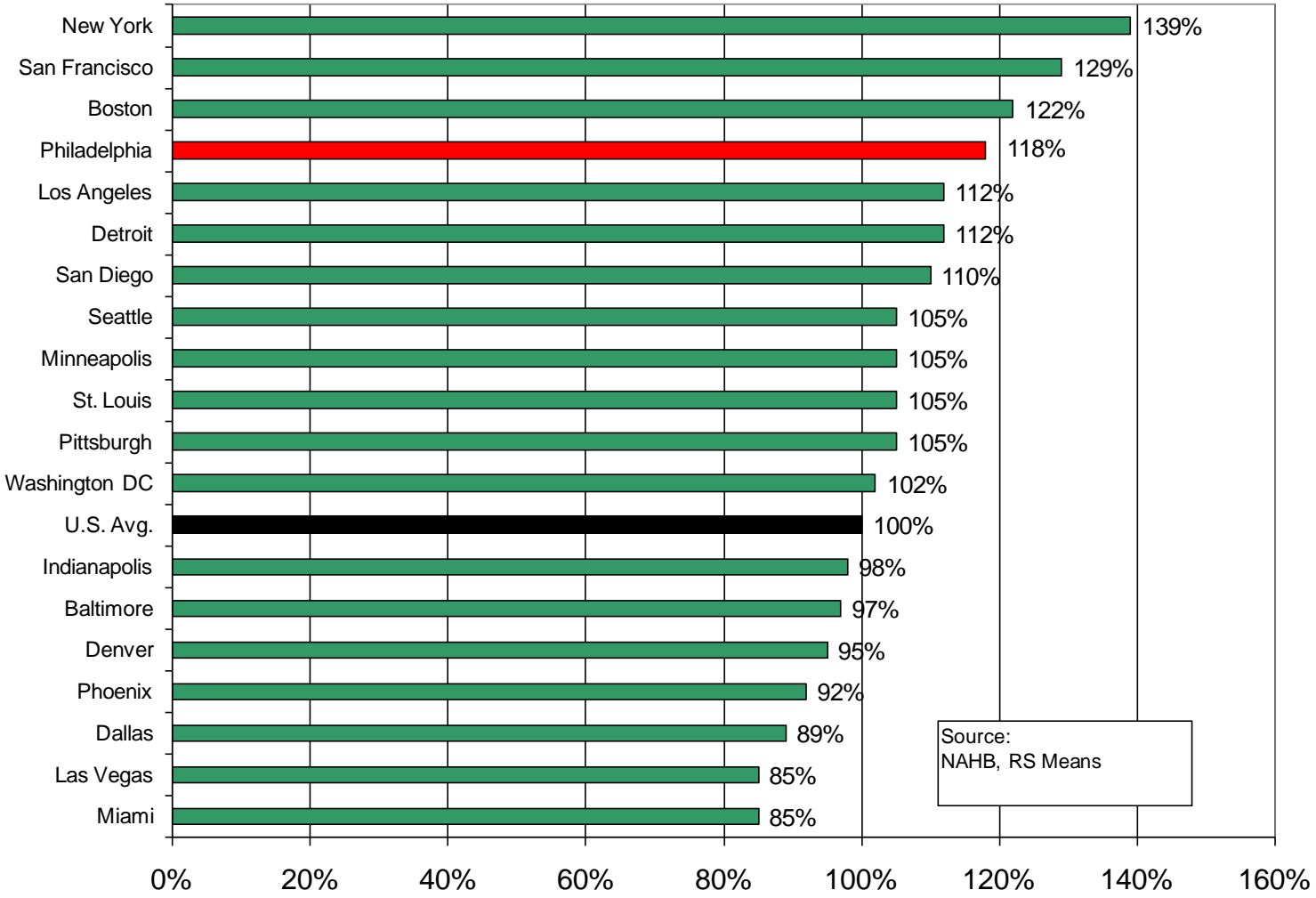
Source: CoreLogic

- What has fallen precipitously in Philadelphia is home sales activity:



Construction costs have not fallen with house prices.

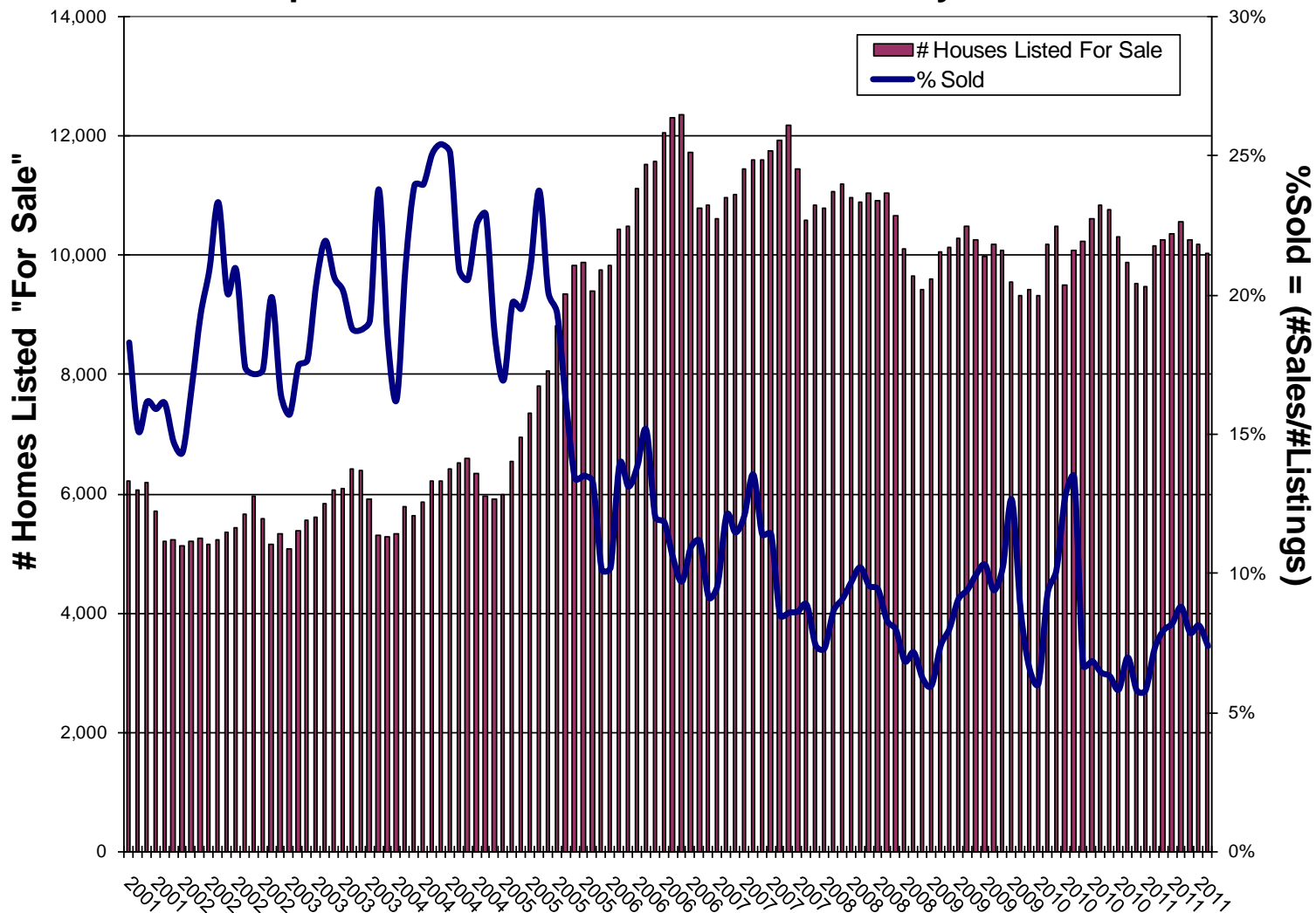
Avg. 2011 House Construction Cost, Relative to U.S. Avg., by City



Source:
NAHB, RS Means

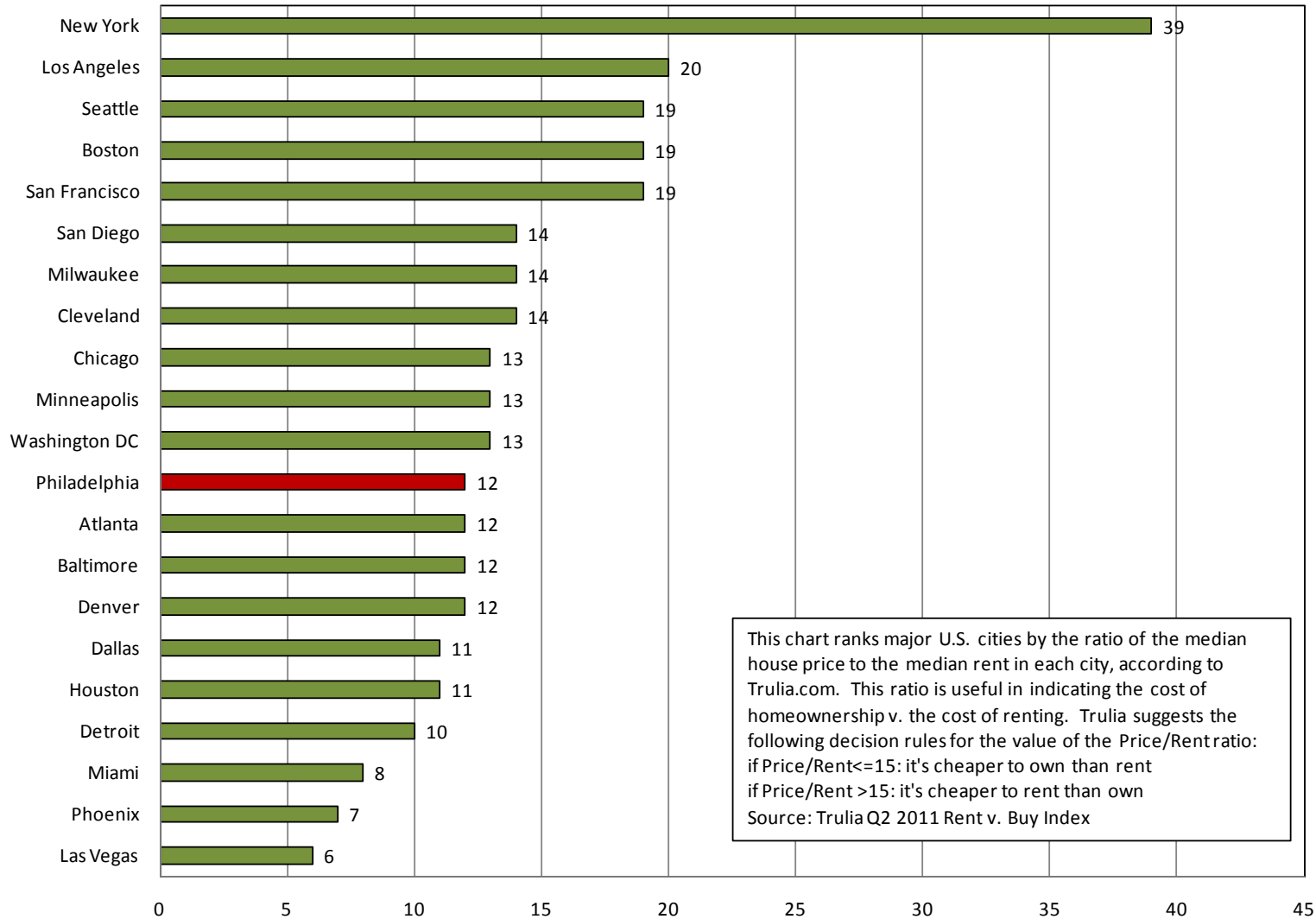
- Inventories remain stubbornly high, and are the primary local obstacle to a housing recovery:

Philadelphia Houses Listed For Sale: Inventory v. Sales Rate

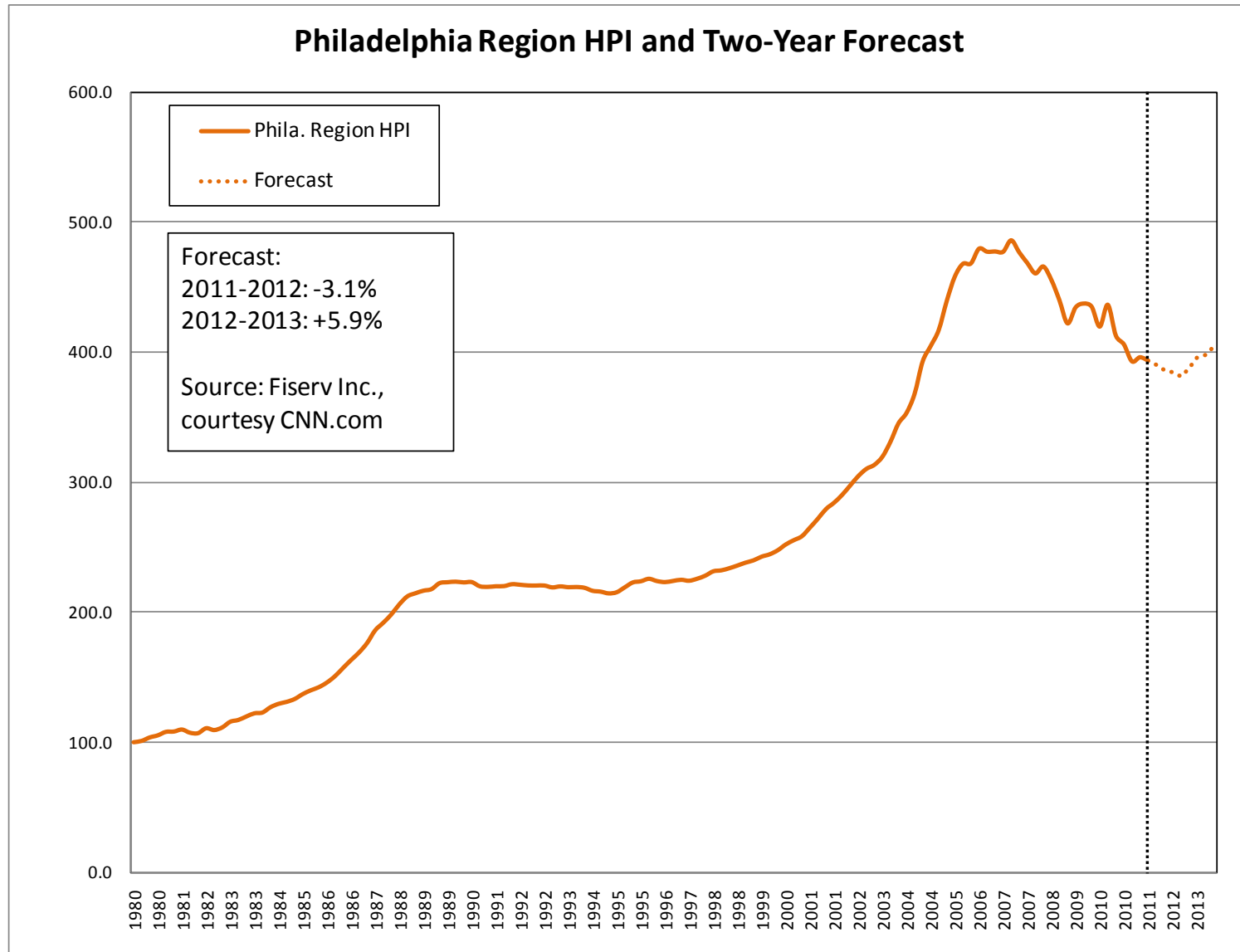


- But, house prices here do appear to be back in line with their fundamentals.

Price/Rent Ratios of Major U.S. Cities



The forecast is predicting some further modest price declines, followed by stabilization and a modest recovery:



Summary of Market Conditions

- **Philadelphia's housing market continues to muddle through:**
 - Despite the difficult conditions of the past few years, we have gotten off relatively easy.
 - The massive waves of price declines, foreclosures and unemployment that hit many other cities largely passed us by.
 - The majority of house price declines appear to be behind us.
 - The housing market has made considerable progress in moving back towards an equilibrium in its fundamentals.
 - **But:** rental market is doing well! (populated by people who can't/won't buy)
- **Where do we go from here?**
 - Most price declines would appear to be behind us.
 - Sales will not rebound until BOTH prices stabilize and credit conditions loosen.
 - The cost of building homes will remain high.
 - The current high level of inventory needs to be reduced before a true recovery can begin.
- **Outlook:** Some further modest price declines (2-5%) through mid-2012, followed by relative stabilization and a sluggish recovery.
- **Strategy:** “Buy, rehab, rent and hold” seems better than “**Build and Sell**”

The Economics of Green Development

Valuation of Green Properties:

Under the Efficiency Hood

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High performance properties are:

Tighter

Warmer

Cleaner

Easier

Longer Lasting

Cheaper to Operate

The basis of enhanced value...

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Great, but...

How much better?

What does it cost and can I sell it?

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Definitions of Green Ratings

Energy Star:

Residential – 2009 IECC; roughly 80 or less HERS number

Commercial – score of 75 or more on Portfolio Manager

HERS / Resnet

Net energy rating scale (embedded within Energy Star; EEM compliant)

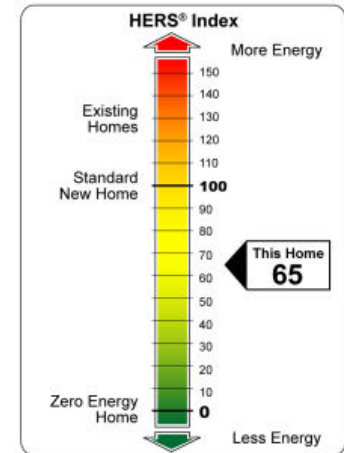
LEED

For Homes – Energy Star minimum required

Commercial – varies; 15% < code building

Passive House

Must consume only 4.75 kBtu/SqFt per year in Heating and Cooling (U.S. average is 47.5 kBtu/SqFt per year). This is equivalent to a HERS 10 rating.



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Residential	Hard Cost	Heating and Cooling Costs- \$/SF		
Code built	\$100/SF		\$1.30	
Level	Expected Hard Cost Premium	Expected Energy Savings-Heating and Cooling	Expected \$/SF Savings	Expected Savings: per 1000 SF
Cost to Energy Star	1%	15%	\$0.20	\$195.00
LEED Silver	6%	20%	\$0.26	\$260.00
HERS 50	11%	50%	\$0.65	\$650.00
HERS 25	12%	75%	\$0.98	\$975.00
Passive House	8%	90%	\$1.17	\$1,170.00

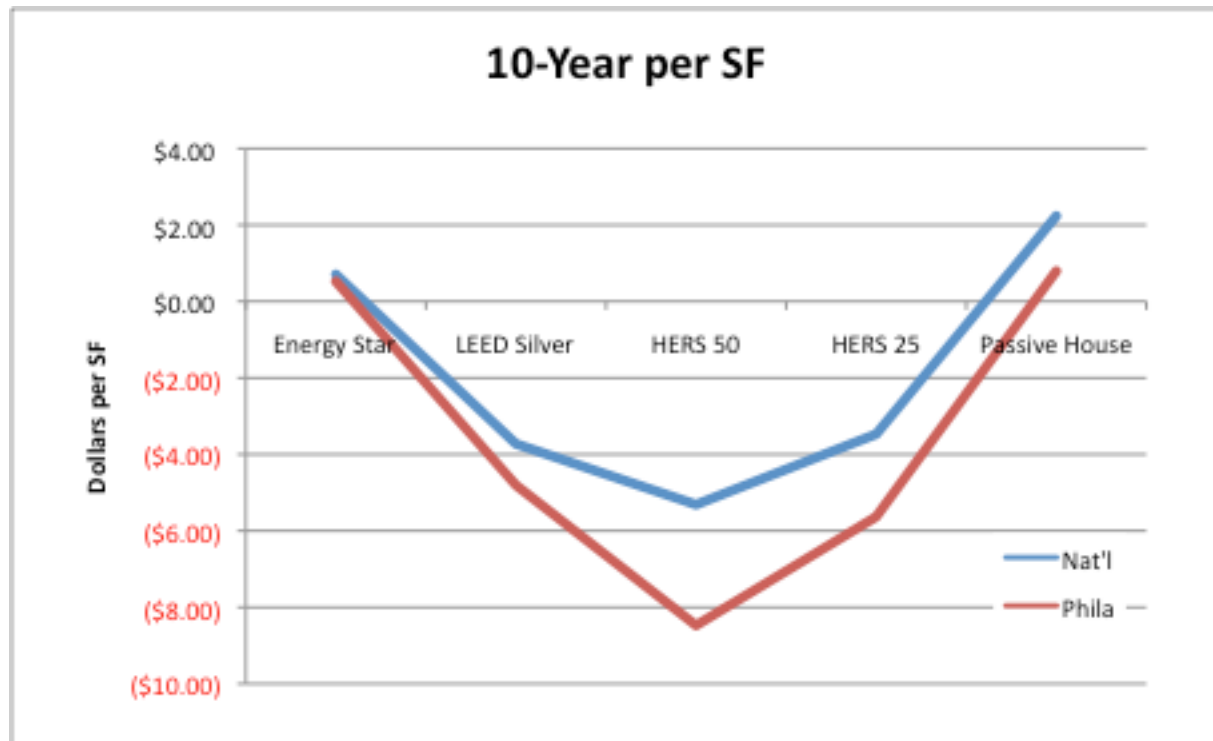
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Residential Level		Expected Energy Savings-Heating and Cooling	Efficiency Hard Cost Premiums to get to this certification (est.)		Return on Investment: cash on cash, first year		Return on Investment: 10-Year NPV (5%), per SF	
			National Average, \$/SF	Philadelphia, \$/SF (118% x Nat'l)	Nat'l	Phila.	Nat'l	Phila.
Energy Star	15%	\$1.00	\$1.18	19.50%	16.53%	\$0.71	\$0.53	
LEED Silver	20%	\$6.00	\$7.08	4.33%	3.67%	(\$3.73)	(\$4.81)	
HERS 50	50%	\$11.00	\$12.98	5.91%	5.01%	(\$5.31)	(\$8.47)	
HERS 25	75%	\$12.00	\$14.16	8.13%	6.89%	(\$3.47)	(\$5.63)	
Passive House	90%	\$8.00	\$9.44	14.63%	12.39%	\$2.23	\$0.79	

The NPV is computed as the present value of the energy cost savings over 10 years (discounted at a 5% rate), minus the cost of the green improvements that create these savings, divided by the square feet of the building.

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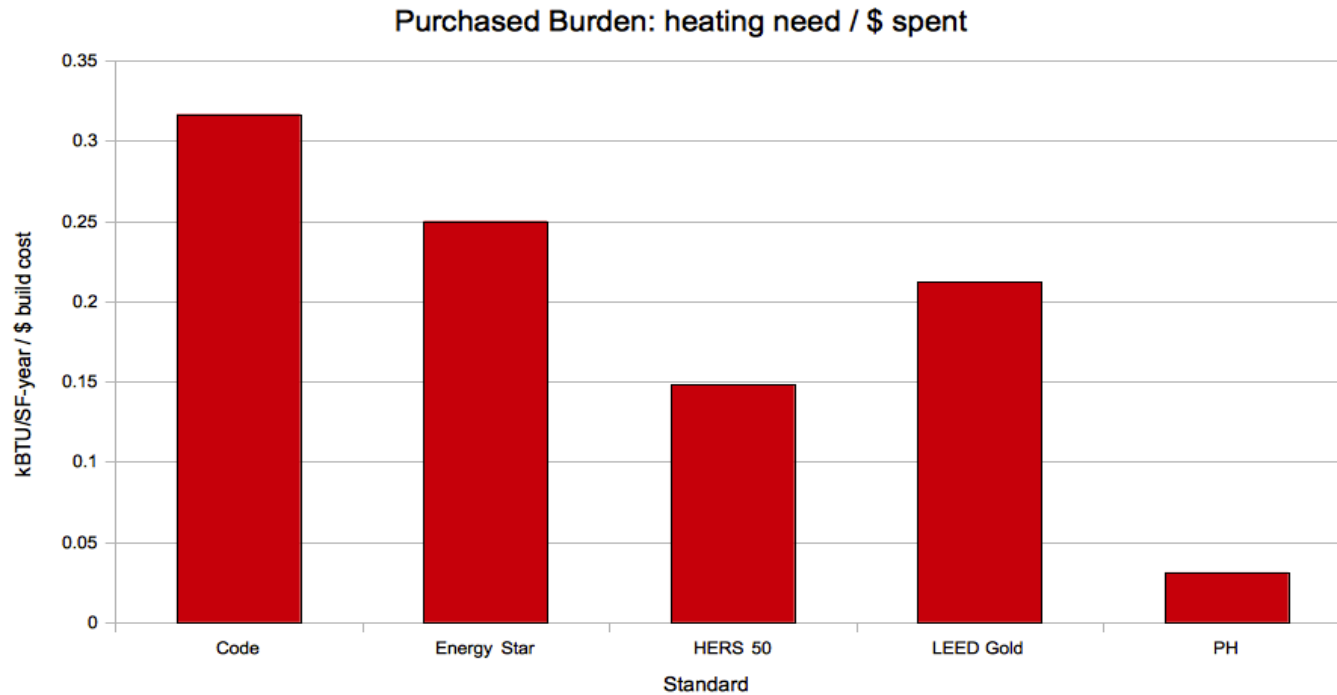
Under current prevailing market conditions in Philadelphia, the NPV (per/SqFt) of energy efficiency upgrades are only positive for either the very lightest of upgrades (Energy Star) or the heaviest of upgrades (Passive House).



The degree and magnitude of energy-efficient improvements are increasing in this direction

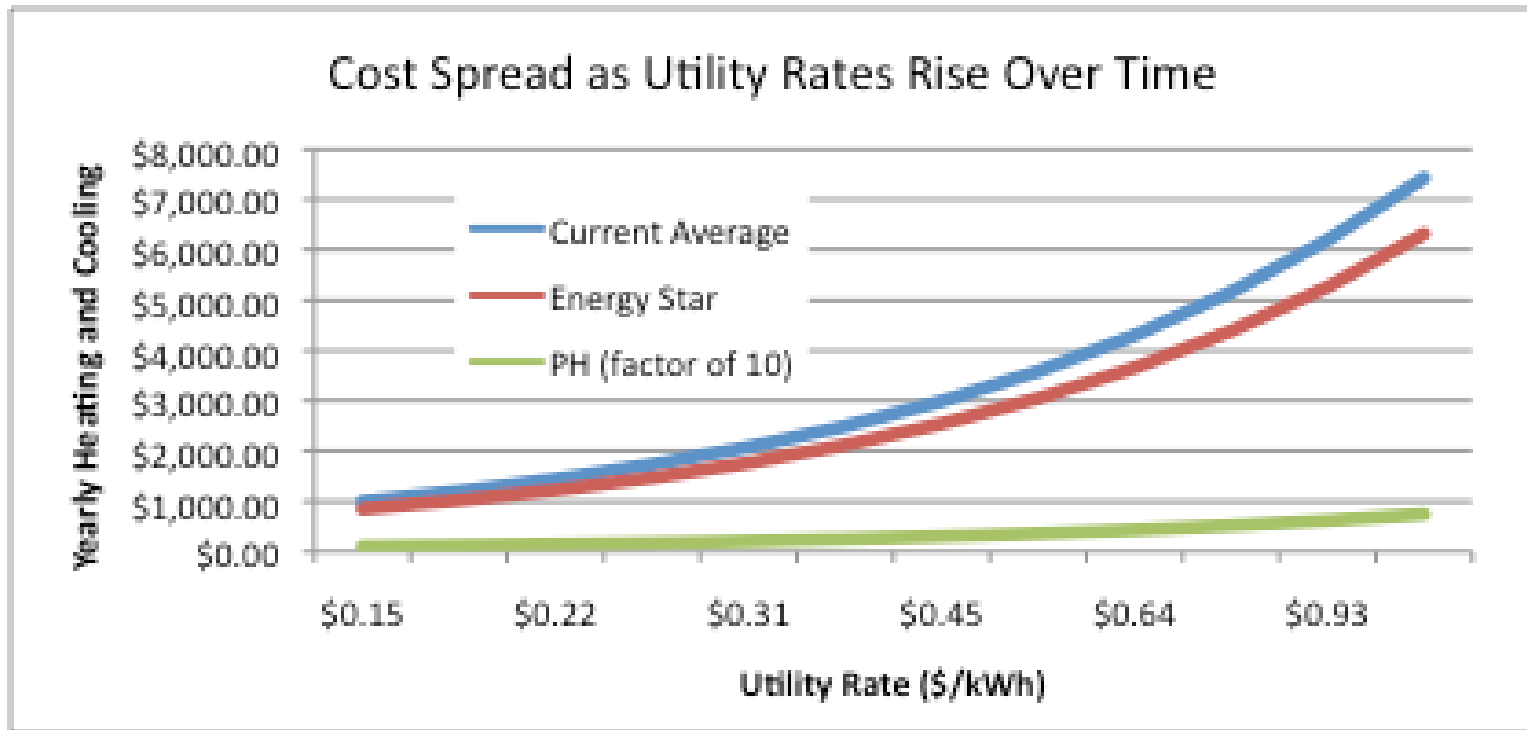
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Purchased Burden



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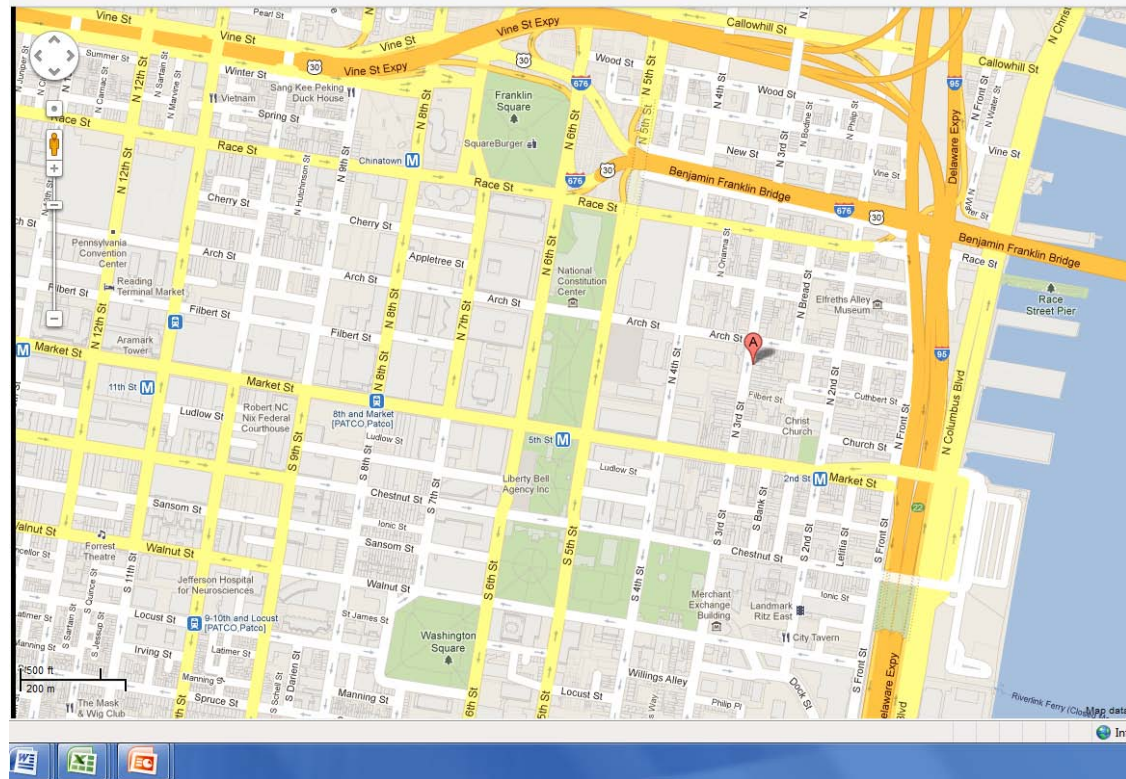
The value of energy-efficient improvements increases as energy costs rise.



The analysis on the previous slide assumed only modest increases in future energy costs (\$/kWh). If energy costs rise significantly, note that the annual utility bill for an Energy Star-rated home is not much different than a non-Green home, whereas the utility bill for the Passive House barely budges.

A Case Study of Green Development

- XXXX North Third St.
- 55 unit apt. bldg.
- 51,390 SqFt
- All 1-bedroom apts., ranging in rent from \$1,395-\$1,475/month
- Annual property taxes of \$76,032 (\$1.48/ft)
- Sold recently for \$7.8m (\$152/ft)



The Economics of Green Development

We model a “Factor 10” retrofit at North 3rd Street.

Assumptions:

- Spend 8% of purchase price (\$12.15/SF or \$624,000) on energy-efficient improvements.
- All money goes into tightening the envelope: new windows, insulation, repointing, new flashing, sealed roof, etc.
- This will reduce the building’s annual heating, cooling and ventilation costs by 70%.

The Economics of Green Development

CONTROL CASE		IMPROVEMENTS CASE	
CONTROLS		CONTROLS	
Purchase Price	\$7,800,000.00	Purchase Price	\$7,800,000.00
Months Held	60	Months Held	60
Interest Rate	6%	Interest Rate	6%
Per SF cost, improvements	0.00		12.15
Construction Cost	\$-	Construction Cost	\$624,000.00
Materials Cost		Materials Cost	
Percent Financed	80%	Percent Financed	80%
Sales Price		Sales Price	
Development fee	5%	Development fee	5%

Control Case	Improvements Case	
\$92,846.72	\$140,536.88	stabilized NOI
2.50%	2.50%	Appreciation rate
\$1,598,646.98	\$1,851,633.34	Total Equity
5.81%	7.59%	COC Return
\$737,137.87	\$72,090.11	NPV (based on sale in year 5)
\$8,609,740.55	\$8,868,032.76	Sale Price Expectation

collection losses	0.60%
CapEx	5%
utilities	9.50%
OpEx	45.40%
insurance	1.60%
marketing	1.30%
R & M	4.30%
contract	4.40%
admin	2.80%
mngmt	3.30%
personnel	8.80%

- 3% rental premium in Factor 10 building
- \$12.15/SF improvements (8% premium on sale price)
- Improvements were on enclosure/envelope to create 70% H/C savings

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- **What if Philadelphia's development costs were in line with the national average?**
 - **Reduce the cost of conversion by 18%.**
 - **Cost drops from \$12.15/SF to \$9.96/SF**
 - **How do the economics of this case study change?**

The Economics of Green Development

Reducing the hard cost of the energy-efficient improvements by 18% increase the NPV by \$142K, or ~200%!

baseline Full Service	PH Full service - Phila	PH full service - Nat'l	Metric
\$92,846.72	\$140,546.03	\$146,199.45	stabilized NOI
2.50%	2.50%	2.50%	Appreciation rate
\$1,598,646.98	\$1,851,595.20	\$1,828,039.28	Total Equity
5.81%	7.59%	8.00%	COC Return
\$737,137.87	\$72,320.44	\$214,576.43	NPV (based on sale in year 5)
\$8,609,740.55	\$8,868,032.76	\$8,868,032.76	Sale Price Expectation

Summary and Conclusions

- **Housing market will remain sluggish through 2012, but the worst is behind us.**
- **Conditions will favor “buy, rehab, rent and hold” over “build and sell”.**
- **Demand for green is there, but willingness-to-pay (in the form of higher prices or rents) is only partially there.**
 - **The data indicate that most green buildings in Philadelphia have no problem getting leased/sold, but not at price premiums that are significant enough to cover the cost of achieving a “green” label; e.g. LEED, Energy Star, etc.**
- **But, this can and will change if energy costs increase.**
- **The current yield on green building is not high, but can pay off as energy costs rise and/or the housing market and economy improve.**