

# Redefining Cost:

A Beacon of Hope Shines through Housing Market Gloom

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let the green in 

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The recent housing market collapse has opened Americans' eyes to the flaws in our traditional way of evaluating the cost of a home. Fortunately, we are beginning to appreciate that the real cost of a home is not revealed in its sticker price but in the combined monthly costs of ownership, including mortgage payments, utility bills, property taxes, and insurance premiums. As we come to understand the important difference between upfront and monthly cost, a change in the way we discuss housing expenses is almost certainly on the horizon, a change that will establish monthly cost as synonymous with true cost. The positive impact of that change will be twofold. First, homeowners will be less likely to find themselves living in homes they cannot afford. Secondly, buyers will be able to see that despite the premium attached to its sticker price, a green home is likely to be more affordable than a conventional home in the long-term.

### Financial Woes on Main Street and in the Housing Industry: Where things went wrong

A proper diagnosis of the problems currently plaguing many homeowners necessarily points to several causes, all of which must be examined in order to understand why change has become so crucial and what the direction of that change must be. Of course, the country's chaotic economic situation is playing a hugely important role. In July of this year the inflation rate in the U.S. climbed to a 17 year high of 5.60<sup>1</sup> percent. Since then it has declined slightly to 4.94 percent in September, but the price of living in America is still rising. On top of paying inflated prices, Americans are beginning to see their earnings decline. In a year-over-year comparison, average weekly earnings adjusted for deflation decreased by 2.5 percent in September. As a nation, our incomes are falling at the same time that we are paying more for the things we need.

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<sup>1</sup> The Inflation rate is calculated from the Consumer Price Index (CPI-U) compiled by the Bureau of Labor Statistics and is based upon a 1982 Base of 100.

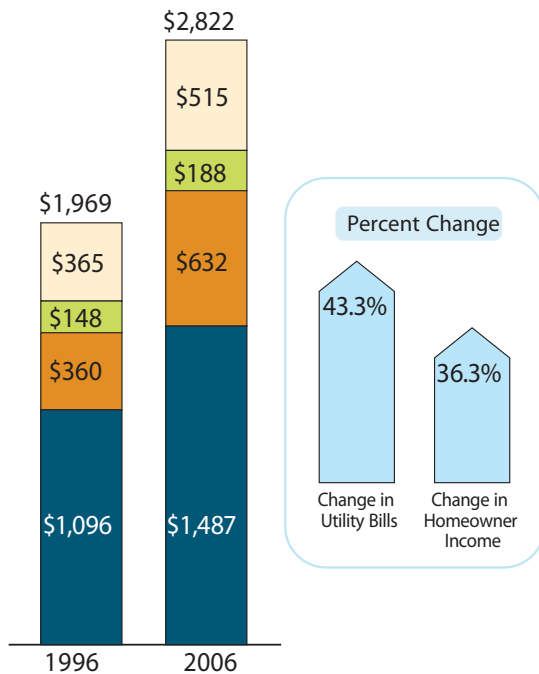


## Energy Crisis Exacerbates Owners' Troubles

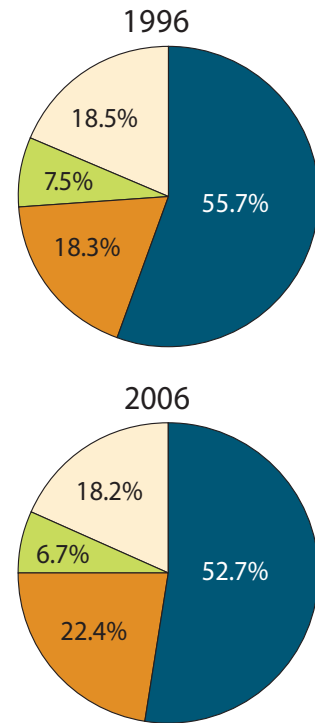
Rising along with the price of almost everything else in the country is the price of maintaining a home, which is due in large part to our current energy crisis. In September, the unadjusted price index for fuels and utilities was up 11.8 percent in a year-over-year comparison. For total household energy expenditures the unadjusted index has risen 13.1 percent: fuel oil and other fuels is up 38.2 percent and piped gas and electricity is up 10.9 points. Even the price index for water as well as sewer and trash collection services was up 6.2 percent in September versus the same month last year.

Long term escalation in the cost of energy has had a sizable direct impact on Americans' monthly utility bills. According to a report released in October 2008 by the Center for Housing Policy, the cost of utilities increased 43 percent during the decade between 1996 and 2006 compared to a just over 36 percent rise in income. Since 2006 we have seen the price of energy soar to even greater heights. The energy index rose 17.4 percent in 2007 and in the first nine months of 2008 it went up 16.6 percent. While the cost of crude oil has fallen drastically in recent weeks, it will inevitably begin to climb again thanks to the simple fact that it is a limited resource, the supply of which will continue to dwindle. The days of \$147 a barrel oil earlier this year revealed just how vulnerable the American way of life is to upswings in energy prices.

**Average Total Utility Bill: Homeowners**  
1996–2006



**Components of the Average Utility Bill**



■ Electric   
 ■ Natural Gas   
 ■ Fuel Oil and Other Fuel   
 ■ Water/Other\*

\*Source: Center for Housing Policy, *Stretched Thin*



In addition to swollen utility bills, the huge jump in the cost of crude oil resulted in adverse indirect effects on homeowners, effects especially pronounced in the many housing developments that have sprawled out and away from urban centers. According to the Center for Housing Policy report, “shortages of affordable homes close to job centers drove many homeowners to buy on the fringes of metropolitan areas...but with rising gas prices, they are now saddled with huge transportation costs.” The average American commute time is steadily increasing: in the 1980s it went up by 40 seconds and during the 1990s, almost a minute and a half. Inflated energy costs have become an even bigger drain on household incomes thanks to their twofold impact on both utilities and owners’ growing commutes. Though not directly related to the cost of a house, the length of a homeowner’s daily commute and the transportation costs associated with it certainly influence the affordability of a home.

## Homes Becoming Unaffordable

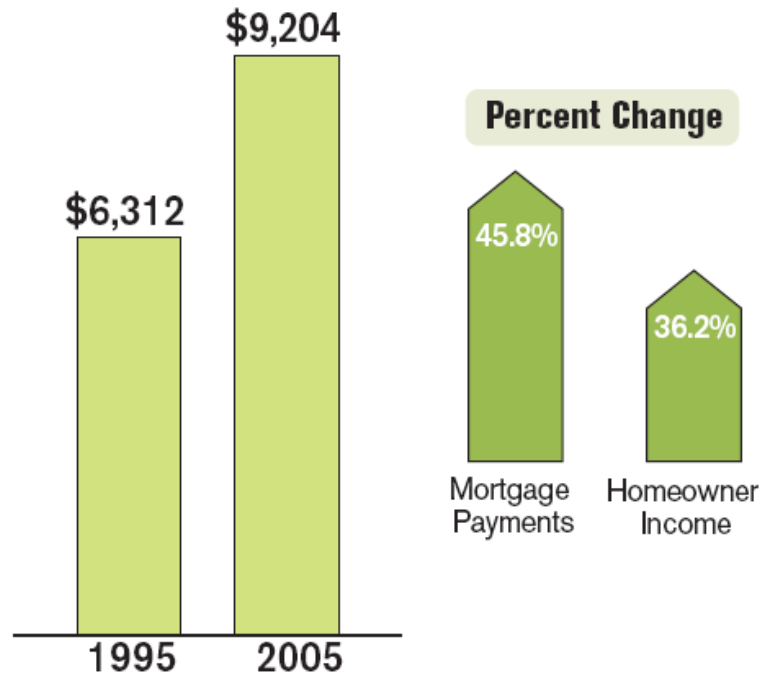
So what do these changes in price, earnings, and even commute times mean for homeowners in real terms? Essentially, Americans are slipping further and further toward being unable to afford their homes, with many having already reached that point. The Center for Housing Policy’s report found that in the ten year period between 1996 and 2006, homeowners saw a marked increase in the portion of their income going toward housing. Twenty-one and a half percent of household income was typically spent on housing in 1996 versus 26.2 percent in 2006. Almost a sixth of homeowners spent over half their income in 2006 on housing costs. On average, housing expenses went up 64.9 percent while homeowner incomes increased by only 36.3 percent.

With average weekly earnings falling and life becoming more and more expensive, it can fairly be said that the housing bubble burst was inevitable. After years of what proved to be unsustainable growth, housing prices began plummeting, a manifestation of how unaffordable our homes had become. The tailspin of home prices has essentially amounted to a collapse of the housing industry. As of the second quarter in 2008, the S&P/Case-Schiller Home Price Index (HPI) had experienced eight straight quarters of decline. Not since 2002 has the real median price of U.S. homes been as low as it was after the second quarter of 2008.



## Mortgage Payments

Median Annual Principal and Interest  
for Homeowners with a Mortgage



\*Source: Center for Housing Policy, *Stretched Thin*

Recent plunges in home prices have done little, if anything to lessen the monthly costs of owning a home, which remain an enormous and growing burden on homeowners. Despite experiencing a mere 36.2 point rise in income over 1995, homeowners in 2005 were paying 45.8 percent more on mortgage payments. Even in today's housing climate, with home prices down from three years ago, mortgage costs are still troublingly high, especially for owners carrying mortgages based on now-overvalued assessments of their home's value. Now that the mortgage market is defined by tightening credit and a lack of non-traditional mortgage products, mortgage costs are still not coming down at a pace to match housing prices.

## Miscalculating the Price of the American Dream

The cost of homeownership is climbing due to the many macro level issues discussed so far, but crucial provocateurs are at work on the micro level, as well. Even absent the current and nearly unprecedented turmoil in the U.S. economy, buying a house has always been an investment that carries some risk. Any number of forces working independently or in concert with each other can tip the scales of a household's finances toward making their home no longer affordable. Bad mortgages, those issued with no or little money down and/or



under adjustable rates, are one egregious example. The phenomenon of these dangerous mortgages, however, is a symptom of a larger problem that plagues the housing industry and homeowners alike.

Homeownership is trumpeted as tantamount to achieving the American Dream, so much so that excitement over the prospect of owning a house may eclipse the forethought that is needed during the buying process. Buying a home is not simply a question of, “can I afford this today”, but also, and perhaps more importantly, “can I afford this on a monthly basis for the foreseeable future.” The proliferation of bad mortgages in recent years is evidence of a pandemic disregard for the latter question. Failure to properly examine the question also leads homebuyers to make purchasing decisions that neglect monthly costs less obvious than mortgage payments. In making such decisions, homebuyers increase their risk of purchasing a home they will one day be unable to afford.

### Time for Change: Understanding Real Cost

On the heels of great calamity often rides profound change. Our nation is in the throws of financial disaster rooted largely in the collapse of the housing industry. As the lessons of that collapse begin to permeate, it is important that chief among them is how desperately we need to alter the terms with which we discuss the cost of a house. Except in rare cases in which a buyer can pay cash upfront, one of the least relevant numbers to consider during the buying process is that of a house’s cost in dollars per square foot. Far more germane are the many factors tied to the monthly cost of owning and operating a home. Now is the time to change the way we discuss the cost of housing so that it is truer to reality and so we can guard against disastrously false perceptions of value.

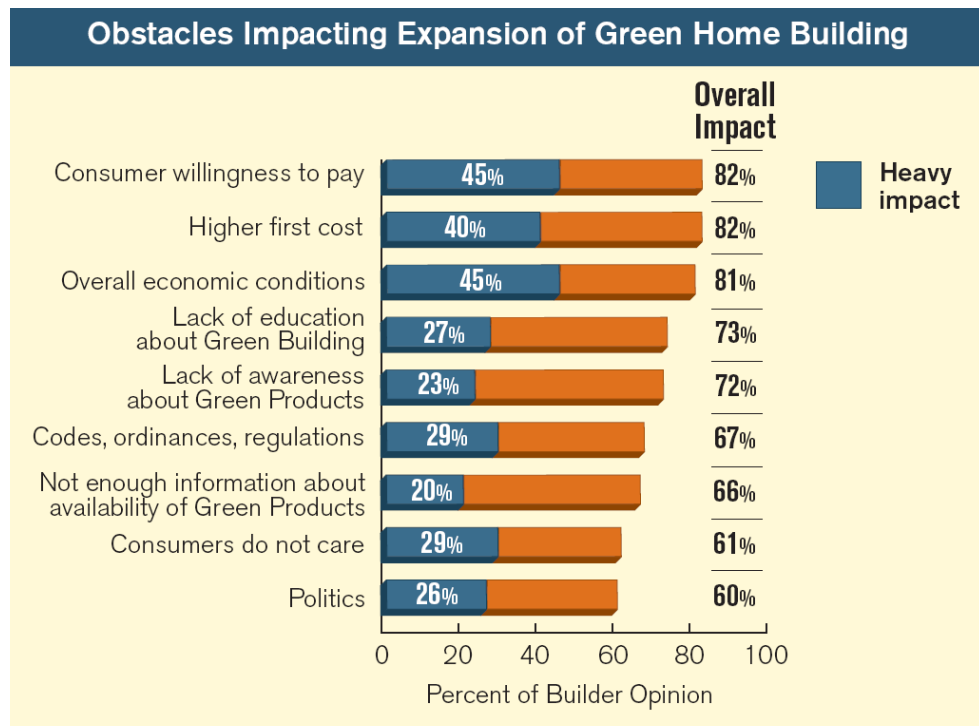
Anyone with experience in homeownership knows that the price one pays to live in a house is much higher than its price per square foot. Only a small portion of homes are purchased upfront in cash; the vast majority of homeowners pay for a house over time in the form of their monthly mortgage payments, which include interest paid on the principle. In addition to their mortgage, homeowners must also pay property taxes, insurance premiums, utility bills, and the cost of maintenance, all of which exert potent influence on the future affordability of a home. Yet when asked to compare the cost of one for-sale home to another, buyers have nothing but the sale price to consider.



Discerning the true cost of a home is an exceedingly complicated task that involves inputs beyond the sticker price. A homeowner fortunate enough to have a fixed rate mortgage will at least be able to rely on consistency in the size of their mortgage. Less consistent over time will be the cost of property taxes, which will change along with the valuation of a house and an owner's tax bracket, as well as insurance premiums, which will change along with fluctuations in replacement costs. Utility bills and the cost of maintenance are perhaps the least predictable costs in the long-term, which, as evidenced in recent months, is especially true with regard to utility bills.

### Monthly Cost Analysis Favors Green

With so many question marks tied to monthly homeownership costs, particularly in today's atmosphere of financial uncertainty, owning a home that lessens the risk of those costs becoming one day unmanageable is an increasingly desirable prospect. That is one of the reasons green homes continue to gain a growing share of the housing market. In 2005, green homes made up just two percent of the market, but this year they are expected to account for anywhere from six to ten percent. By 2012 that market share is expected to jump to between twelve and twenty percent. Yet U.S. builders site "consumer willingness to pay" as the second largest obstacle impacting the expansion of green home building. The upfront cost of the "green premium" attached to sustainably designed homes remains in the way of green building's expansion into the mainstream.



\*Source: McGraw-Hill Construction, Green Home Builder Survey, 2008



However, seen through the lens of monthly costs, the price of a green home will often be lower than that of a conventional home, substantially so in some cases. Based on the findings of several studies, it is estimated that the premium for building green lies around one to two percent on average. That premium results in higher monthly mortgage payments and higher property taxes on a green versus conventional home. The increase in those particular monthly costs, however, is often offset by lower utility bills and, to varying degrees, lower maintenance costs and higher tax deductions.

Couch the discussion of a home's cost in monthly terms and a sprawling, inefficiently designed home on the far outskirts of suburbia will begin to look like less of a good deal compared to a slightly more expensive green home. A home's price per square foot can hardly reflect what the impact of that house's overall design will have on facilitating sustainable monthly costs. A giant McMansion may seem like a bargain based on the sticker price, but the cost of heating, cooling, and maintaining all that space year after year might very well make it more expensive in absolute terms than a green home with a slightly higher price tag.

### Monthly Cost Comparison Illustrated

To demonstrate the revealing nature of a monthly cost analysis, Michelle Kaufmann Companies performed an in depth comparison between the cost of a Sunset® Breezhouse™ home (a "green" house designed with a minimal environmental footprint) and a conventional home, both located in Menlo Park, California, based on the first year of ownership. The first step in determining the monthly cost of the two houses was to assign each one a sales price, beginning with the Sunset Breezhouse home. At \$250 a square foot, a 1,800 square foot Sunset Breezhouse home would cost \$450,000 plus an estimated \$168,000 for a quarter acre of land for a total of \$618,000. We assumed that price to include a 3 percent "green premium" as compared to the price of a similarly sized conventional home, putting the sticker price of the conventional home at \$600,000.

With the sale price of each home established, we then determined the associated monthly costs. Assuming a twenty percent down payment and a thirty year mortgage at a six percent interest rate, the monthly mortgage payment for the Sunset Breezhouse, including both principle and interest, would be \$2,964.18 as compared to \$2,877.84 for the conventional house. To complete the PITI (principle, interest, taxes, insurance) equation we added the state and local property taxes (based on the roughly 1.3 percent rate in Menlo Park) as well as the annual insurance premium (estimated at \$2,400 for both) divided over twelve months. The total for the Sunset Breezhouse was \$3,733.68 and for the conventional home is was \$3,627.84, which equates to \$105.84 in savings for the conventional home.



| <b>Monthly Cost Comparison:<br/>Sunset® Breezehouse™ home vs. conventional home (first year of ownership)</b> |                                       |                      |   |
|---|---------------------------------------|----------------------|---|
|   | Sunset<br>Breezehouse<br>@ 3% premium | Conventional<br>Home | Cost Difference<br>(Sunset Breezehouse<br>home less<br>conventional home) |
| Sale Price  | \$618,000.00                          | \$600,000.00         | \$18,000.00   |
| Loan (80% of sale price)  | \$494,400.00                          | \$480,000.00         | \$14,400.00   |
| <b>Gross calculations</b>   |                                       |                      |   |
| Mortgage (PI) <sup>1</sup>  | \$2,964.18                            | \$2,877.84           | \$86.34   |
| Property Tax (T) per month <sup>2</sup>   | \$669.50                              | \$650.00             | \$19.50   |
| Insurance (I) per month   | \$200.00                              | \$200.00             | \$0.00  |
| PITI  | \$3,833.68                            | \$3,727.84           | \$105.84  |
| Energy Costs  | \$101.03                              | \$183.23             | \$82.20 savings*  |
| Water Costs   | \$8.46                                | \$34.93              | \$26.47 savings*  |
| Total Utilities   | \$109.49                              | \$218.16             | \$108.67 savings*   |
| Gross monthly cost (PITI + Utilities)   | \$3,943.17                            | \$3,946.00           | \$2.84 savings*   |
| <b>Net calculations</b>   |                                       |                      |   |
| Interest paid on Principle  | \$29,498.84                           | \$28,639.65          | \$859.19  |
| Tax deduction (28% Fed + 9.3% CA) <sup>3</sup>  | -\$13,999.75                          | -\$13,591.99         | \$407.76 savings*   |
| Tax deduction by month  | -\$1,166.65                           | -\$1,132.67          | \$33.98 savings*  |
| Net monthly cost  | \$2,776.52                            | \$2,813.34           | \$36.82 savings*  |

<sup>1</sup> Assumes a 30 year fixed mortgage at a 6 percent interest rate

<sup>2</sup> Based on 1.3 percent rate in Menlo Park, California

<sup>3</sup> Tax deductions expressed in negative terms as they represent savings

\* Green fill indicates a savings over the conventional home

**NOTES:**

1. This calculation does not account for maintenance costs nor the use of on-site alternative energy systems, both of which would add to the Sunset Breezehouse home's savings.

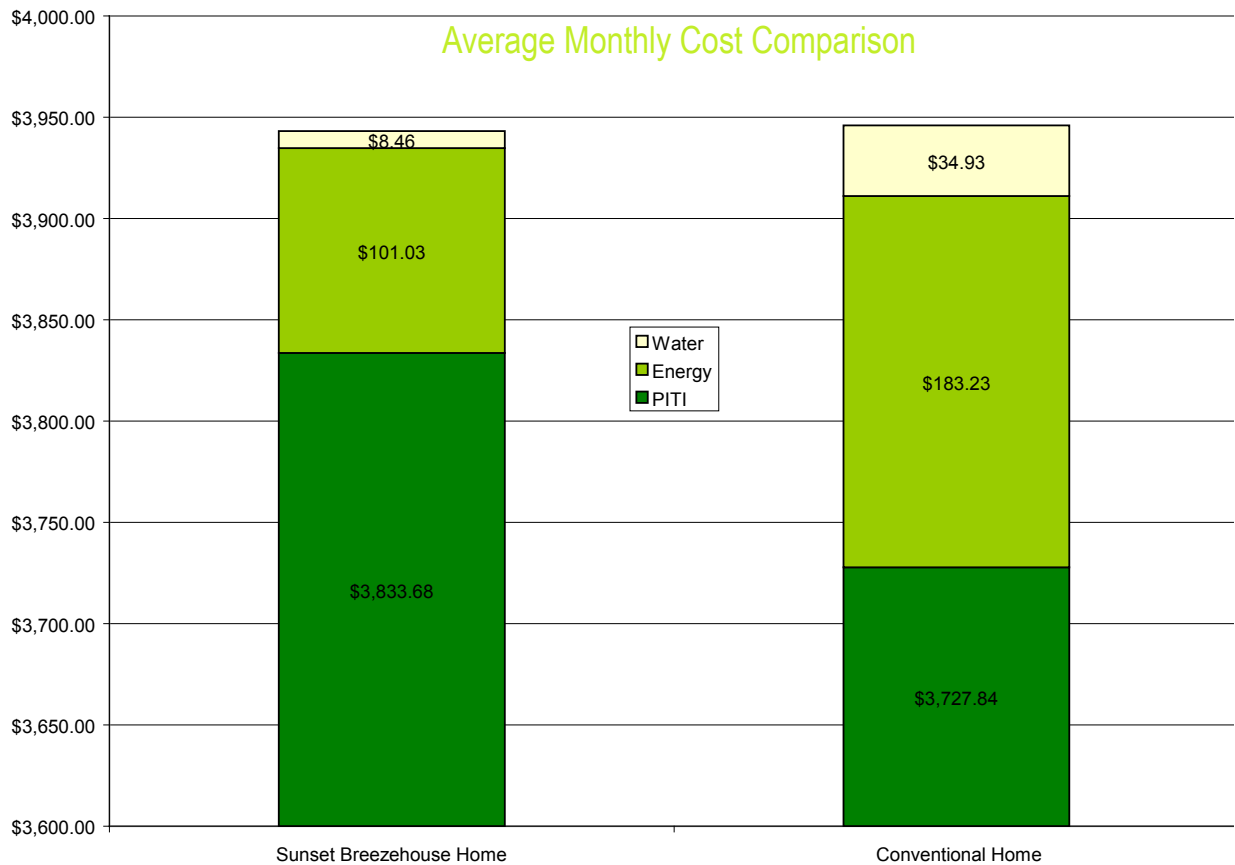
2. As the price of crude oil rises in the future, the energy cost savings in the Sunset Breezehouse home will grow more and more every year.

## Green's Advantages Shine Through

Considering its higher sale price, it is unsurprising that the Sunset Breezehouse home would thus far in our calculations prove more expensive than the conventional home. However, when we assessed the monthly utility costs in both homes, the tables began to turn. To gauge the size of the utility bills for each home we relied on data drawn from an in-house energy consumption study of both the Sunset Breezehouse and a comparably sized conventional home. We ran the simulation using the U.S. Department of Energy's EnergyPlus modeling software<sup>2</sup>. Based on the resulting data and Menlo Park's local energy rates (\$0.16/kWh for electricity and \$1.21/therm for gas) we calculated that the monthly energy bill for a Sunset Breezehouse home (without solar panels) would average \$101.03 a month while the conventional home's bill would average \$183.23 for a difference of \$82.20.

<sup>2</sup> EnergyPlus reads inputs and then models heating, cooling, lighting, ventilating, and other energy flows as well as water in buildings.





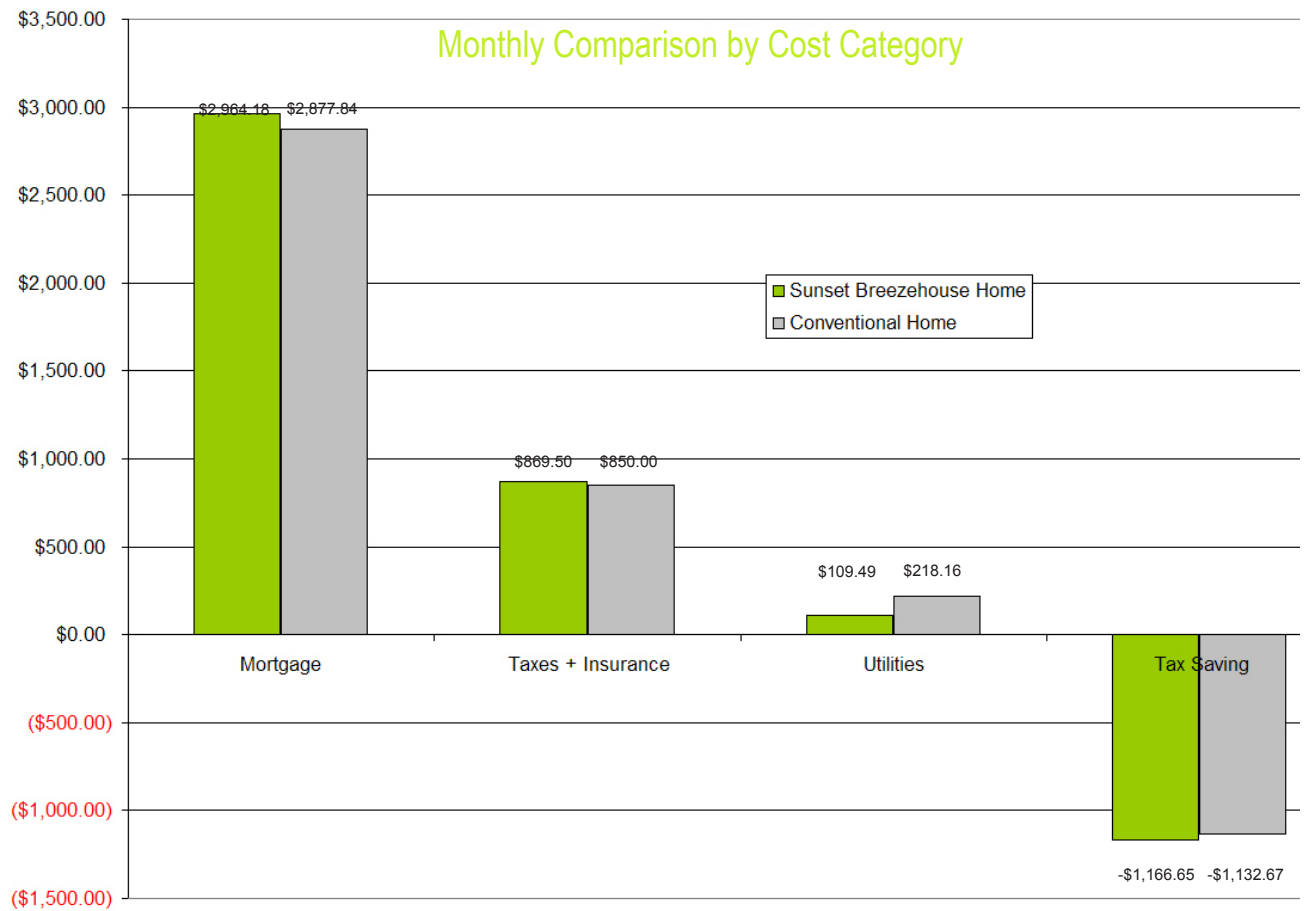
To determine average monthly water expenses, we used data collected from another Michelle Kaufmann home located in Northern California. The MKD home consumed 86 gallons per day on average, just 24 percent of the typical Northern Californian household's monthly average of 355, which we assumed to represent the conventional home's water usage. Using the average residential rate for water in California (\$36.39 per unit of 1,500 cubic feet) we found that the difference translated into a savings of about \$26.47 a month. Combined with the difference in energy costs, this amounts to a \$108.67 monthly saving on utility bills for the residents of the Sunset Breezeshouse home, which more than makes up for the \$105.84 difference in PITI costs.

The final step in calculating and comparing the monthly cost of ownership of the two houses was to determine the value of the tax deductions for each. To that end, we estimate a certain level of household income. We assumed that our hypothetical residents would be married couples filing jointly with total incomes over \$89,638<sup>3</sup> and under \$173,500<sup>4</sup>. Each household would enjoy a savings equal to 37.5 percent of their mortgage interest and local property taxes for the year. The monthly average of that savings would be \$1,166.65 in the Sunset Breezeshouse home and \$1,132.67 in the conventional home. Therefore, the net savings on the sustainably designed Sunset Breezeshouse home over the conventional home amounted to a total of \$36.82 a month and \$441.79 a year.

<sup>3</sup> The amount that marks the 2008 threshold at which a household meets California's highest marginal rate of 9.3 percent, save a one percent surcharge on taxable incomes of \$1 million or more.

<sup>4</sup> The amount that marks the 2008 cutoff for the 28 percent marginal federal tax rate





In both our gross and net calculations the Sunset Breezeshouse home proved to be a money saver on a monthly basis. The energy efficient design and water saving features of the green home result in substantially lower utility bills as compared to a conventional home, which offset the higher mortgage payment and property taxes in our example. In climates less temperate than California's the savings on energy would be even greater<sup>5</sup>. Also important to note is that house and land prices are significantly higher in Menlo Park compared to the national average; in less expensive areas, the utility savings of the green home would outstrip the initial price difference by even more. At the end of our calculations, the larger tax deduction associated with the Sunset Breezeshouse home made the overall savings undeniable. Despite the premium attached to it, the Sunset Breezeshouse home was less expensive to own on a monthly basis and in absolute terms than the conventional one.

Not included in our comparison but certainly worthy of mention are several other homeownership costs that impact the real cost of a house: its maintenance costs, its future resale value, and its impact on the cost of commuting. An examination of each of these factors again reveals the advantages of sustainable design. A green home, for instance, will be built with long lasting materials that require little or no maintenance, which will translate into savings. The

<sup>5</sup> An energy study performed on an mkSolaire™ home on exhibit at the Museum of Science and Industry in Chicago found that the home's annual energy consumption would cost \$1,977 compared to \$3,230 for a typical Chicago bungalow of the same size for an average monthly difference of \$104.42.



growing demand for green homes is also driving up resale values. For example, it is estimated that for every \$1 reduction in annual utility costs achieved via energy efficiency retrofits, the market value of a home increases by \$10 to \$25. Combine a green home with a green location (one close to an urban center or public transportation so that residents are less dependent on their vehicles) and the savings on commuter expenses can also be counted as a financial advantage of sustainable design.

### Lessons Learned from Crisis

One important lesson often begets another. The convergence of the financial, energy, and housing crises has essentially become a perfect storm with the power not only to weed out the risky and damaging housing industry practices of old but also to encourage the promulgation of more economically and environmentally sustainable practices going forward. These three crises have combined to teach our nation that we have been doing some very important things the wrong way for too long; among them is the way we discuss the cost of our houses. The lesson we should glean now, during this tumultuous period when change has the best chance to take hold, is that housing costs should be trenched in realistic monthly terms rather than in terms of the price per square foot of a home.

If we are wise enough to follow that lesson, the subsequent lesson is that sustainably designed homes are valuable not just in ecological terms but in hard financial terms, as well. Because green home building embodies the principles of financial and environmental sustainability, today's chaotic state of affairs is just what is needed to catapult green homes into the mainstream market. A green home may cost more in a dollar per square foot analysis, but its built-in efficiencies and other factors will often offset the upfront price difference and lead to a lower monthly cost of ownership and more affordable home in the long-term. Judged on its monthly cost, a green home will likely prove the most economical purchase a homebuyer can make.



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