

***True-Cost Pricing for Sustainable Development:  
Finding the real bottom-line in sustainability.***  
**By Judi Schweitzer**

Legislators, investors, developers, builders and individual home owners are reeling from the deluge of information about, and scary images of, what our world's future will be unless we dramatically change our habits, appetites and lifestyles. What we have needed for some time is nothing short of a market transformation in energy and water use, as well as rethinking our whole concept of costs. Against this backdrop, it's encouraging that more and more people are embracing the urgency of energy and sustainability issues. We are beginning to understand that we need to live differently for future generations to have the quality of life that we have enjoyed. And, we need to account for the improvements and multiple benefits in our decisions.

### **Show Me the Money**

When it comes to sustainable development, as in many fields, the adage "show me the money" applies. The market transformation noted above will not happen if all we do are the easy things (changing light bulbs, recycling our trash, even riding a bicycle to work). But the bigger things are expensive. Just how expensive is the question. If we account only for the first costs of a component (that is, the initial cost of implementing a program and/or product), or even the life-cycle costs (the total costs over a program's or product's lifetime, including savings), we are missing the boat. We must broadly adopt a whole new way of valuing true costs, not just financial, but also environmental and social — Full Cost Accounting (FCA) or True Cost Pricing (TCP) — to create the sweeping changes necessary to protect our environment and enhance our real wealth. One stepping stone to understanding true value, FCA and TCP, is to begin to quantify the real cost of incorporating sustainable products and practices into a project and then —and this is important —quantifying the value the end-user (homeowner, resale buyer, etc.) places on those sustainable elements. We learned from our study of the Terramor planned community in Orange County, California that home builders resisted adopting sustainable building practices and incorporating solar photovoltaic (PV) and other sustainable products and systems into their homes because they believed home buyers would not pay a premium for these elements. But what we found in our analysis was the opposite: There is a ready (and we believe expanding) market of home buyers who value sustainable elements in their homes and communities; they understand there will be real operating savings over time, and will pay more for the opportunity to live in a home and a community that are designed with sustainable living in mind. Our study also pointed to an information and education gap between builders and their customers, underscoring that the builders' marketing of their homes missed many opportunities to make potential buyers aware of the value of the sustainable elements. Only with better information about how various elements interact harmoniously and synergistically in a house or community system, and which combinations of elements provide the right optimal balance of investment (of money, raw materials, labor and environmental impact) and return (operating savings, energy reduction, local energy production, enhancing environmental and social quality of life, and brand equity), can we make the true and accurate economic case for homes that are built to be sustainable. Since our initial study, our ongoing research into quantifying the true value of sustainable residential development has led to additional discoveries. But before we discuss those, let's re-set the stage. Terramor is the 5th Village at Ladera Ranch, a 4,000-acre, masterplanned community that is the largest solar-photovoltaic, planned community in the United States and possibly in North America (at least to date). The master developer, Rancho Mission Viejo (RMV), required that the 10 home builders purchasing lots in the community adhere to certain "green" building and development practices, recycle construction waste, and incorporate certain sustainable features.

### **FINANCE**

#### **Buyers Value Sustainable Homes**

Earlier research my firm conducted in conjunction with Brooke Warrick of American Lives indicated that the majority of home buyers would pay a premium in excess of the average cost to produce a sustainable home. Further investigation reveals that documenting realized, annual-fuel savings (or energy efficiency) from sustainable construction translates directly into higher sales prices. Real estate economist Mark Boud and I confirmed what Nevin/Watson described in the 1998 Appraisal Journal study, Evidence of Rational Market Valuations for Home Energy Efficiency, that there is an inverse relationship between annual, fuel-cost savings and home sales prices. In other words, reductions in

annual fuel costs show a positive relationship to increased sales prices. Our follow-on research confirmed that, compared to other homes of equal size and type at Terramor Village, those with PV roofing are appreciating at a faster rate. The original sales prices of the SFD homes with PV were 2.3 percent higher (just over \$17,000/unit) while resales of the same size homes sold for an average 4.1 percent premium or just over \$42,000 per unit on average. This resale data at Terramor from 2004-2006 also shows that homes with PV roofing averaged appreciation of 37.1 percent while homes without PV averaged 34.6 percent. This research predates the current housing market and we currently are in the process of updating this data.

### **All “Green” Evaluation Systems are not Created Equal**

Working with many clients who want to develop sustainable communities, we are reminded that not all have the vision, leadership and resources of a Rancho Mission Viejo. We also see that many well-meaning and environmentally sensitive organizations are embracing one or another of the emerging evaluation systems or “green certification programs” (such as LEED-H, Health House, California Green Builder, Build it Green and Zero Energy Homes) for certifying the “shade of green” or degree of sustainability their projects have attained. Designers and builders hope to find a “sweet spot” that balances costs with environmental benefits, but are learning that these programs do not necessarily make that easy to do. On any given project, results depend on interrelated issues including climate zone, location, product types, linkages to transit systems (transportation being one of the largest users of energy), and the expertise of the team creating the project. More importantly, those of us championing the application of Total Cost Pricing in these “economic” evaluations find fatal flaws in the subjective, point-based systems of determining eligibility for certification or meeting certain sustainability criteria. What is needed are “nutrition labels” for buildings that quantify the developments’ full costs and real performance compared to regional averages, as is done in the UK. This approach, much like the Energy Star labels for appliances, would enable the investor in real estate to make more informed decisions. As a member of California’s Green Building Code Advisory Committee, my firm is driving to make building TCP the rule in California.

### **Energy-Efficient New Construction is not Enough**

The Terramor findings are exciting, and the California legislative and utility initiatives are inspiring. With all due respect, they constitute a raindrop in the ocean. Even though statistics for global energy use and green house gas (GHG) emissions differ from those for the United States alone, the report of the Intergovernmental Panel on Climate Change shows that 48 percent of all energy use and GHG emissions in the United States comes from buildings, making buildings the largest user/emitter nationally. However, in California transportation is higher than buildings. If we are going to see a market transformation in energy use that will save our planet from the catastrophe that is approaching faster than we want to believe, concentrating legislation on new construction is not enough and it penalizes the good guys (those market leaders who are voluntarily innovating well in advance of any mandatory regulations). These master developers like RMV and others with significant vision and scale are experimenting with integrated systems and economic models that take into account TCP principles on a communitywide scale and are pursuing marketbased, high-performance solutions rather than compliance-based, subjective, points-based solutions. Legislation and regulation are tools that work best at the end of an innovation cycle to force the skeptical or resistant into compliance with what has become the norm.

### **The California Plan**

California has adopted AB-32, the Global Warming Solutions Act of 2006 (the state’s key climate change legislation). With its adoption, California is moving toward a strategic plan calling for 100 percent Zero Net Energy for new homes by 2020. Even if we achieve the strategic standards on new homes, new construction accounts for less than 2 percent of the total housing market and contributes approximately 0.15 percent of total emissions, according to the most recent studies conducted by ConSol. Because the seriousness of climate change has finally hit us, and in the aftermath of the adoption of AB-32, many municipalities are trying to do something, anything, to address the problem. They, too, are focusing on new construction. Some 38 California cities have adopted some kind of voluntary or mandatory “green ordinance,” complicating the problem for decision-makers seeking sustainable solutions. While we support incentives to encourage the brave and innovative in the sustainability arena to do even more, we have to wonder about the majority of existing buildings when 98 percent of the residential energy use and greenhouse gas emissions production comes from existing housing.

## **True Costs and Benefits of Sustainability**

AB-32 is a key tool in California's attempt to deal with the current market misalignment where the "cost" of a design or investment choice reflects only part of its true cost. With TCP, as mentioned above, the economic decision of what to invest in or buy is informed by an analysis of all the costs and benefits involved. An example is solar power, which may be more expensive to install (first cost), but can avoid many indirect costs that are difficult to quantify all the way up the supply chain (the global political, environmental and economic consequences of importing and transporting oil, not only from its source, but from terminal to dealer, dealer to user). Actual costs, i.e. costs avoided and benefits attained, are real but can be elusive. Unless they are quantified and included in the homebuyer's value equation, the buyer might believe solar to be more expensive than it actually is by underestimating savings and benefits (particularly when considering the energy cost savings over the lifetime of the installation) and reject the solar option. Time and again we bump into the expense barrier to adopting sustainable practices and technologies. If the home builder believes that all the return on his or her investment for installing solar components will flow to the homeowner in lower electric bills over the years, we have another "split incentive dilemma." Programs, incentives and regulatory mandates for new construction are too frequently aimed at the end-user (the homeowner) when they need to be aimed at the person(s) or entity(ies) making the initial investment in the sustainable system or element (the developer or builder) so as to overcome the financial first-cost barriers. When we look at ways to spark market transformation in retrofits (e.g. existing buildings), the picture is even more complicated. To whom should the incentives flow? What behavior and choices do we want to encourage? In short, what will work, and quickly?

## **Berkley's F.I.R.S.T Program Targets Older Homes**

One good example of a voluntary and flexible mechanism that overcomes this "split incentive dilemma" in the retrofit market is found in California's AB-811 (Contractual Assessments) which was passed in July 2008. AB-811 empowers municipalities to fund installation of energy-efficiency and renewable energy upgrades to existing residential, commercial, industrial, or other real property through the sale of bonds to cover the initial first costs – only those property owners who elect to make these types of improvements are affected by the assessment. The repayment is stretched out over the life of the energy generation or conservation addition to the building, and repayment is made through tax rolls. If the property is sold, the encumbrance runs with the land and the next owner continues to pay off the remaining balance in their property taxes. Palm Desert, Berkley, and San Diego are the forerunners. Palm Dessert has sold out its first phase with \$2.5 million in loans for about 100 homes, and it has reservations on \$3.2 million of the additional \$5 million in loans the city is planning for phase two. Berkley now also waives the building permit fees for solar installation on single-family homes.

## **Conclusion**

As more and more of earth's inhabitants accept that the planet is not ours to trash, and that generating waste—in our backyards, our businesses or our projects — is not a sustainable practice, we are turning back to nature for instruction on how to get out of this mess we've created, reverse ominous trends, and change our behavior and ultimately save our planet. We are beginning to grasp that energy renewables have both immediate and long-term value and that they are, in fact, a fundamental foundation of our national security and economic strength. We have the technology that will give us a secure future and a livable planet. The key is to find ways to identify and design solutions to overcome barriers and to make better design, development and investment decisions that are based on true costs and benefits, and not simply favor cheaper-priced alternatives for only short-term monetary gains. In the final analysis, individuals change their behavior when they perceive the benefit of doing so outweighs their natural inclination not to give up comfortable habits and lifestyle expectations. I believe the work my colleagues and I are doing to evaluate and document achievable savings, and more importantly, the real total costs and total benefits of choices related to sustainability in our built environment, will support the move towards more meaningful sustainable programs. States such as California, as well as agencies like the California Public Utilities Commission, the California Energy Commission, the state's utilities, and cities/municipalities such as Berkeley and Palm Desert are leading the way in their efforts to create incentive programs. These programs coupled with voluntary mechanisms such as AB-811 along with sustainably oriented codes, standards and regulations that are adopted or are being adopted, will result in the market transformation that we so desperately need.