Greener and Leaner with Energy Efficiencies and Solar: One Family's Quest to Eliminate Their Electric Bill

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"I am issuing a call to action, for Congress, the energy industry and the public," he said.... "I am calling for a new American revolution – an energy and climate revolution..."

Gov. Bill Richardson
Governor of the State of New Mexico
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Invoking President Kennedy's call for the Apollo space program, Gov. Richardson explained that the nation needs a "man-on-the-moon" effort to develop technologies that will cut energy costs and halt global warming. This month, in our series on energy conservation and solar in the Valley, we walk you through a "conversion" with a family who is doing their part to incorporate energy efficiencies into their lives through our comprehensive "Five Star Energy Audit"…first the audit and THEN the solar.

Implementing energy efficiencies first and the solar conversion after efficiencies are realized will allow a shorter payback period. Every solar customer, from residential and non-profits to commercial, will benefit from conversion in this manner. Of course, not every customer goes green this thoroughly, though this particular family will realize the greatest potential in lowering their solar system cost with this approach…because the greater the electric need…the larger the system needed to power it.

Lower your needs and lower your solar system cost. Simple.

These following preliminary steps give the customer an immediate three to five times return by reducing the cost of solar systems by $3 to $5 for every dollar spent on those efficiencies. For example, a $2,000 variable speed pool pump will reduce your energy use by enough to decrease the cost of your planned solar system by $6,000 to $10,000…$1,000 in LED lighting will easily remove $3,000 to $5,000 from your solar installation cost…all because your electric load needs are now reduced.

The Challenge: A young couple who are in the Valley only six months out of the year experience high electric bills in a four-year old, Southwestern-style home with a pool. They plan on moving into the home full time in 10 years and until that time want to eliminate their electric cost and lower their gas bills. They also want the option of adding more solar collection capability should they have the need once full time residents.

The Criteria: This home is a solar installer's dream with plenty of flat, unobstructed roof space, a great true-south facing direction and plenty of garage space for the inverters to silently convert their direct current (DC) to alternating current (AC) for their grid tied connection. I believe it's wrong to simply add a solar system to a home in need of some serious efficiency upgrades. It's always best to consider the entire equation before implementing a solution.

Since increasing energy efficiency and cost savings is our first goal in this 2,600 square foot home, we

have set aggressive energy target savings with the homeowner's blessings. We intend to tighten up the home's energy use so that we can install a system that will be 25% less costly after these efficiencies.

(Depending on the type of energy efficiencies that they decide on from our list of recommendations we will be able to lower their current kilowatt needs by 25% while allowing them to increase the size of the system [should they need to] when they make the full time move in 10 years.)

The Solution: As mentioned, we focus on five efficiencies and with each one we demonstrate an exact return-on-investment calculation:

1. **Sola-Tubes** for natural lighting and elimination of any daytime electric lighting.
2. **Solar Powered Attic Fan** ventilation to exhaust the oppressive desert heat from enclosed attic area without any additional electric use.
3. **Variable Speed Pool Pumps** to reduce the cost of circulating pool water by up to 80% (comes with a free pool leak detection analysis in the month of June).
4. **LED Lighting** to reduce electric lighting costs by up to 90%.
5. **V-Kool** window tinting to reduce heat gain in the house by up to 55%.

We evaluated the La Quinta home for the addition of all five and the family smartly decided not only to move forward on all of them, but to add a few more efficiencies as well:

6. A low wattage, electric **Garage Fan** to keep the temperature in the garage up to 8 degrees cooler than the outside ambient temperature.
7. Energy efficient, **UV Protective Sky Lighting** to replace their standard, "tract" domed covers.
8. A **Solar Thermal** system to heat their pool in the winter when they enjoy escaping the snow surrounding their second home.

We recommended, proposed a cost breakdown, scheduled and are in the process of installing these efficiencies. We are also preparing the "before" and "after" electric load requirement snapshot of their solar system size and cost, and processing all the available federal, state and municipality rebates. As you may recall in the last issue, an energy generating solar appliance will dramatically lower and/or eliminate energy bills, and available state rebates can offset up to 30 percent of the cost. There are also federal tax incentives on both commercial and residential installations, thus making conversion to solar a much easier solution. With these energy-saving measures incorporated first, the cost of the entire system will be much lower because it will have to generate less electricity to cover the use in your new, improved and energy efficient home or commercial property. In fact, on an average home, it takes seven to ten years for the system to pay for itself, and with energy prices soaring, the time will no doubt prove to be much shorter.

We look forward to sharing the final numbers on this La Quinta Case Study with you as well as a breakdown of the final cost and payoff of the solar system in our next article. We'll also let you hear from the homeowners themselves to see what they think about their new "greener" home and their new "leaner" bills.

For your immediate questions and concerns on your personal energy management opportunities, please visit us at www.renova360.com and/or contact us directly at 760-568-3413. Vincent Battaglia is a founding member of the U.S. Green Building Council's Inland Empire Chapter and a general contractor as well as co-owner of Renova, a Valley-based energy efficiency and solar energy company that helps clients take steps to lower energy use before converting to a renewable energy source.