



# SOLAR DECATHLON 2009

## Incorporating Solar into Residential New Construction

Solar Decathlon  
Building Industry Day





# Presentation Objectives

- Highlight the benefits of solar energy for homebuyers (photovoltaics or PV)
- Highlight the value of solar PV for builders
- Explain the key factors related to incorporating solar PV into new homes
  - Before, during and after construction



## BP Solar Introduction

- More than 35 years experience in the design, manufacture and marketing of solar PV systems
- >2,000 employees worldwide
- 2009 Volume 170 MW
- Annual R&D budget >\$10M
- Strong brand awareness and reputation
- 1<sup>st</sup> Builder America project completed in 1997





## PetersenDean Introduction

- Largest independently owned solar roofing company in U.S.
  - Operates in 5 key solar states
  - In operation for 25+ years
- 10+ years of experience providing solar solutions to production homebuilders
- Diverse solar installation expertise
- More than 1 million people live/work beneath our roofs





# Solar PV Value to Homebuyers

- The most efficient and logical time to go solar is during construction
  - Efficiency in installation
  - Minimizes costs (vs. retrofit)
  - Built in financing through 30 year mortgage
- Combined with energy-efficiency, solar is typically cash flow positive for most homebuyers in 1<sup>st</sup> month
- Allows homeowner to better manage the home's operating costs
- Helps the home appreciate faster and command a higher resale value
- An energy-efficient, solar home is perceived to be a higher quality home





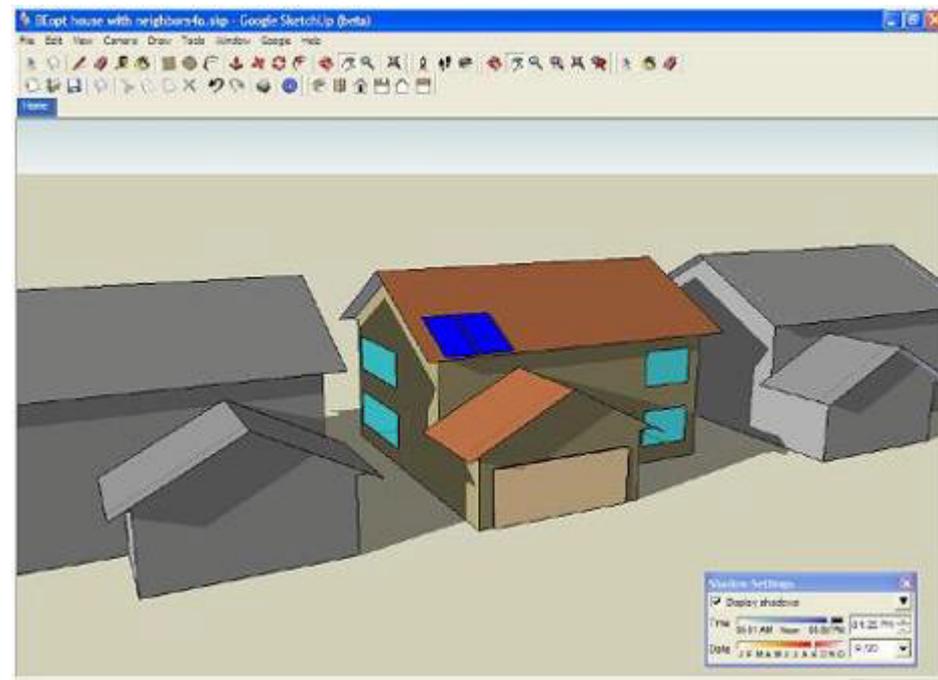
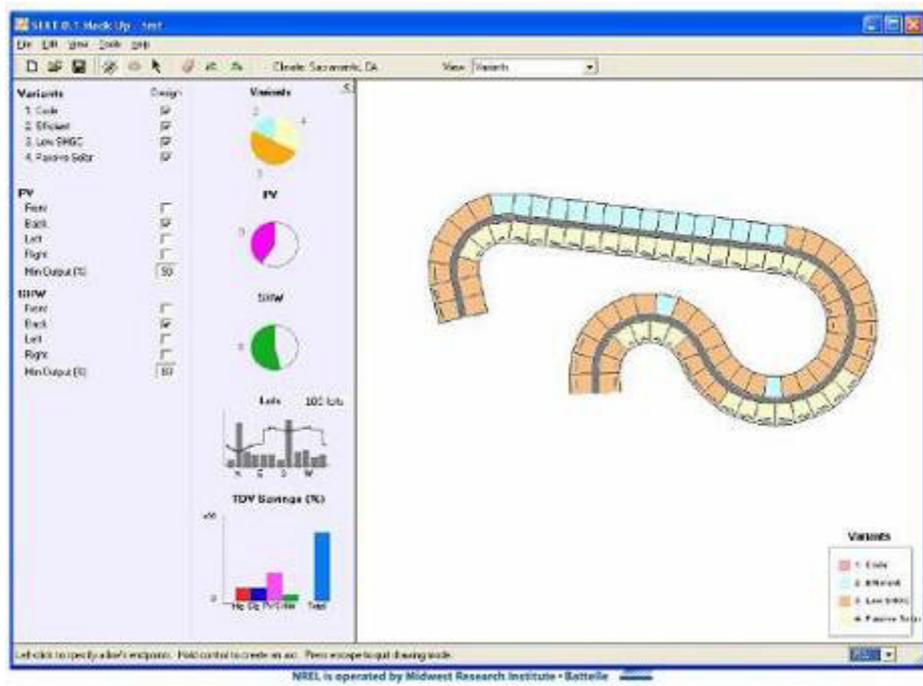
## Production Builders are “Going Solar”





## Good solar PV starts before construction: Planning

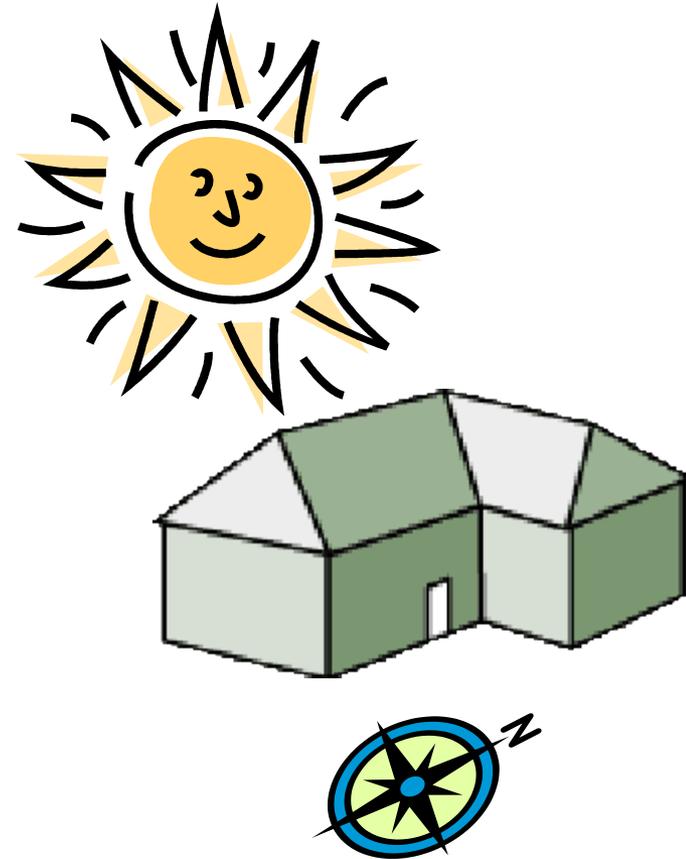
- Starts with community layout, proper orientation of streets and lots
- NREL Subdivision Energy Analysis Tool (SEAT)





## Good solar PV starts before construction: Shading & Design

- A southern orientation is ideal
  - East and west facing roofs can still capture over 80% of the energy
- Minimize roof obstructions to maximize PV capacity and aesthetics
  - Shading can significantly reduce energy production
  - Plan for current and future landscaping, neighboring houses and roof “stick-ups”
- Approx 100 sq. ft. of roof for every kW of PV capacity
  - 2.5 – 5.0 kW for new homes depending size of home





## Good solar PV starts before construction

- Incorporate PV into the home design (roof elevation plans)
  - South facing roof exposure of homes
  - Consideration of placement of venting to improve usable space



Photo courtesy Shea Homes Active Adult Division





## Good solar PV starts before construction: Partners

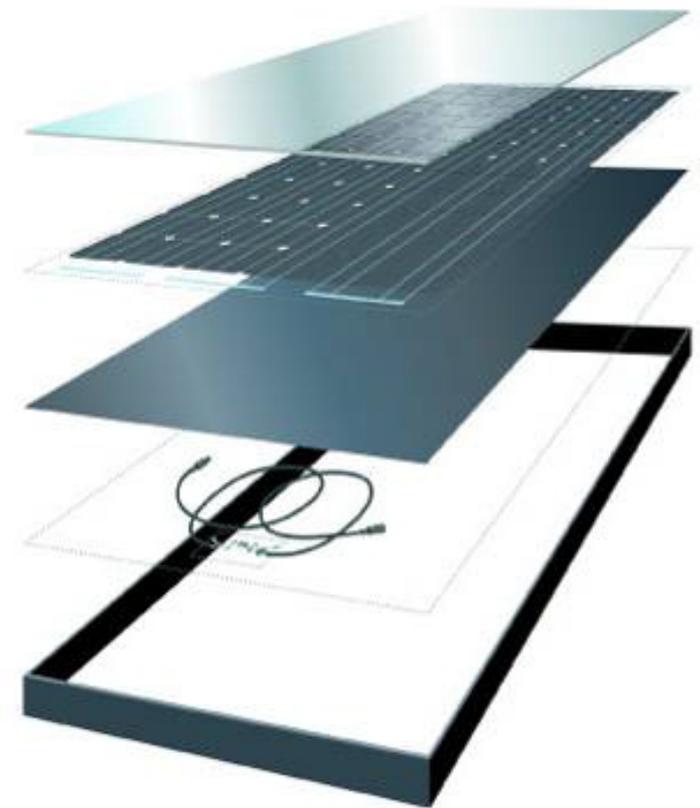
- Selecting a capable partner
  - Reliability and long term value is key
  - Ability to coordinate well with other trades
  - Ability to support the sales of your green solar home
  - Does partner's brand support your home sales?





## Good solar PV starts before construction: Product

- Latest PV technology not necessarily the best
- Key decision is lifetime cost of solar energy, rather than upfront \$/Watt
- Reliability metrics:
  - Low warranty return rates





## Good solar PV starts before construction: Aesthetics



versus





## Good solar PV starts before construction: Aesthetics

- PV system aesthetics are important to homebuilders and to new solar homebuyers



Photo courtesy of Petersen-Dean and Christopherson Homes





## Good solar PV starts before construction: Standard vs. Option

- 3 year National Renewable Energy Laboratory study

Attributes	Conventional Wisdom	New Market Paradigm
Sales Prices	<ul style="list-style-type: none"> <li>•HPHs cost more to build vs. other homes</li> <li>•HPHs are priced higher</li> </ul>	<ul style="list-style-type: none"> <li>•HPHs can be built and sold competitively and profitably</li> </ul>
Solar PV as Option vs. Std. Feature	<ul style="list-style-type: none"> <li>•HPH's should be an option only</li> <li>•Sales of HPH's are minimal</li> </ul>	<ul style="list-style-type: none"> <li>•HPHs should be offered as standard.</li> <li>•Transaction costs are often too high when solar is sold separately</li> <li>•Homebuyers have difficulty understanding the value of solar as an option vs. other options</li> <li>•Sales may be accelerated because salespeople do not have to "sell" the solar feature</li> </ul>
Satisfaction	<ul style="list-style-type: none"> <li>•Homebuyer satisfaction is contingent on perceived payback of energy features</li> </ul>	<ul style="list-style-type: none"> <li>•Solar HPH owners perceive three major kinds of benefits:               <ul style="list-style-type: none"> <li>– (1) altruistic</li> <li>– (2) financial</li> <li>– (3) personal satisfaction</li> </ul> </li> <li>•Solar HPH owners appear to become increasingly more satisfied over time</li> </ul>





# Good solar PV starts before construction: Standard vs. Option?

- Solar PV: upgrade option or standard feature?
  - Some builders have found improved profitably from increased sales velocity that reduces capital costs
  - Enhanced incentives when PV standard feature
  - Salespeople invest more when PV is standard feature
- Challenges of selling as an upgrade option:
  - Selling the value vs. other high priced options
  - Energy product that customers can't touch and feel
- When offered in a community where solar is also pre-plotted on a certain homes, options may do better.



## During construction

- Maintain the roof integrity
  - An integrated solar roofing solution
  - Products that reduce roof penetrations
- Installer that can work within the homebuilder's production process
  - Scale
  - Forecasting and scheduling
  - Coordination with other contractors





# Post Construction

- Promoting your Solar Community
- Training your salesforce and staff
- Educating the prospective solar homebuyer
- After Sale Support



## Post Construction

- Expert training for your employees
  - Sell the benefits of a solar home vs. the technology
  - Capitalize on perception that an energy-efficient, new solar home is higher quality
  - No better time to incorporate solar
    - positive cash flow from day one
    - Increased resale value
  - De-bunk the common myths
    - Power available when power outage
    - Solar PV produces electricity not hot water





## Post Construction

- Educate the prospective solar homebuyer
  - Energy-savings assessment / rating to communicate the value of energy-efficiency features as well as the PV system
  - Literature, videos, and other tools to simplify the selling
  - Periodic onsite selling support



### Eco-Friendlier from the Ground Up

At Trilogy, giving back to the environment for the precious building materials it provides is as important as building the best, eco-friendly homes. We do our part by using wood certified from sustainable forests, conserving lumber and recycling construction materials whenever possible. With garages equipped with electric-vehicle charging stations, weather-responsive sprinkler systems, energy-efficient appliances and so much more, Trilogy homes are designed to build eco friendly living into your life.

- Shea Green Certified™
- Certified Wood from Sustainable Forests
- Recycled, High Performing Insulation
- Lumber Conservation
- Construction Material Recycling Program
- Water-Conserving Appliances and Fixtures
- Outdoor Water Conservation
- Electric-Vehicle Charging Stations
- So What's Your Carbon Footprint?



**Shea Superology: It's not just how we do things. It's how we do things better than anyone else.** No wonder Professional Builder Magazine has named Shea Homes "2007 Builder of the Year" for overall excellence in homebuilding, design, management, marketing, community relations, and customer satisfaction.



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# Post Construction

- After the Sale
  - Warranty terms and reliability
  - Service calls cost builders time and money – both in responding to calls and customer perception
  - Warranties are not all equal
  - A long warranty does not mean it's reliable
  - In these economic times, be sure your partner will last as long as the product



## Summary

- Combining energy efficiency with solar maximizes homebuyer benefit
- Design and build a community that maximizes energy efficiency and solar potential
- Solar aesthetics matter
- Find strong partners that not only deliver solar but also help your company leverage it to sell more homes
- Train your sales force to understand and educate prospective home buyers on the value of a new solar home