



CHOOSE SOLAR TEMPERING Step 7

Recent advances in building materials and techniques have convinced designers of cost-effective zero energy homes to reduce emphasis on full passive solar design in favor of “solar tempering.” There are many reasons for this shift among them are variable climate factors, the higher cost of low U-value/high SHGC windows, the benefits of having fewer windows, the high cost of thermal mass, and the risks of overheating if passive solar is not properly implemented. Solar tempering provides a cost-effective alternative that involves taking advantage of solar heat gain without increasing window area or cost. It works best when the common living areas and most windows face south. Optimal shading lets in winter warmth and excludes summer heat. Solar tempering provides added light and warmth to the living areas and may reduce heating costs by 10% to 20% without added expense and without risk of overheating in summer

For effective solar tempering include these elements in the design phase:

- Specify higher Solar Heat Gain Coefficient (SHGC) windows on the south side with a SHGC of about 0.4 or more, if cost effective.
- Aim for a 14% window-to-floor area (WFA) for the whole house, with about 50% of the windows on the south side where the common living areas should be located. Depending on local circumstances, more windows on the south side may not always be cost effective.
- Design for optimal shading for maximizing winter sun and ensuring summer shade to the south windows. Since the sun angle is the same in March and September, the length of a fixed overhang will always be a compromise. Consider shorter overhangs and then control unwanted solar gain with moveable, exterior shading, such as awnings or vegetation.
- Calculate the solar heat gain in BTUs during the design phase. Be sure to use energy modeling software that calculates these solar gains. REM/Design, REM/Rate, EnergyPlus, and Energy10 software all include passive solar gains in their calculations.
- Consider recommending insulated cellular shades, such as the Duet Architella shades from Hunter-Douglas, which have an R-value of close to 4, in order to help keep out cold or heat depending on the season. They should be installed with minimal gaps at the edges, and the homeowner must be willing to close them on cold winter nights and on hot summer days.

With solar tempering you gain the value of solar heat with considerably less cost than with passive solar strategies.



BUYER

What are Zero Energy Homes?
Cost Less to Own
20 Advantages of Living in a Zero Energy Home
Zero Energy Home Care
Positive Energy Homes
Appraisal and Mortgage Strategies for Zero Homes
Case Studies

BUILDER / DESIGNER

Zero Homes are Comparable in Cost to Standard Homes
Twelve Steps to Affordable Zero Energy Home Construction and Design
Zero Energy Home Building and Design Course Calendar
Builder Subsidies, Incentives, and Tax Credits
Certifying Zero Energy Home Performance
Zero Energy Building Case Studies
Resources for Builders and Designers

SELLER

Zero Energy Homes of the Future are Available Today
Zero Energy Home Sales Tips
Zero Homes are Comparable in Cost to Standard Homes
Net Zero Home Sales and Appraiser Courses Online
Appraisal and Mortgage Strategies for Zero Homes
Sales Kit
Glossary of Zero Energy Terms

RENOVATOR

Remodeling on the Path to Zero for Homeowners
Zero Energy Retrofits for Builders
Financing Renewable Energy and Energy Efficiency Upgrades for Existing Homes
Zero Energy Remodels Case Studies



SIGN UP FOR OUR FREE NEWSLETTER