



The Modular-Home Advantage Single-and Multi-Family

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February 22, 2011

Sustainable Development — The New Trend

**Clean energy luring
investors' greenbacks**
Venture capitalists raise stake in turbines, fuel cells



Lower costs, higher demand produce eco-friendly projects across the USA

New live-work community for Boulder

Sopris guarantees homes will use less energy

**Holiday Neighborhood project
pilot for environmental efficiency**

**US Green Building Council
LEEDS RATING**

Energy Star Homes

McStain boasts new methods

Green-Building Reality Check for Onsite Construction

- The onsite-built home is only as “green” as what the subs build, and most are unaccustomed to green design.
- A high-impact “green” feature—spray foam insulation—is very costly to do onsite.
- It can be a challenge to find a team experienced enough to cost-effectively design & build “green.”
- Green elements identified at the design phase often get reduced by budget constraints as the project progresses
- Dealing with city and county codes adds uncertainty and costs.

Why Modular Construction?

- The ease of repeating a healthy & green specification, same team every project
- Speed of construction can reduce build time by 60% or more
- Indoor-build environment eliminates impacts of weather on construction time & quality
- Close to zero waste
- State permitted

The Financial Benefits

- Shorter build time
 - Lower interest-carry
 - More projects per year
- Far fewer change orders
 - Offsite costs are locked in at contract
 - Less onsite work = fewer change orders
- Cost savings with economies of scale
 - Factory has more buying power than a typical contractor, developer, or housing authority

The Project Benefits

- True build-to-order
 - Quick build times allow for optimized project scheduling
 - Home and foundation/infrastructure built simultaneously
 - Start building only when you have a buyer or proven demand
- Minimize existing-neighbor issues
 - Noise impacts go to near zero
 - Less sub traffic
- Modular story drives sales
 - Factory tours

The Consumer Benefits

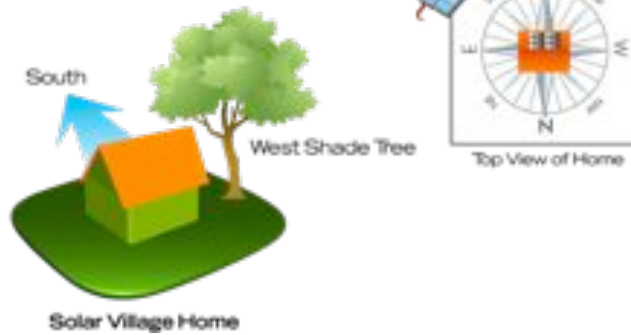
- True build-to-order
 - Occupants can move in as quickly as three months, from time of order
- A green and healthy home that they can afford
- Whole community centering around these principles
- Affordable utility bills

Pitfalls to Avoid

- Not having an understanding of the factory strengths and limitations
- Using products the factory has no experience with
- Working with an architect that has limited experience with modular homes
- Trying to manage the modular-build process on your own

Designing Homes to Zero-Energy Goals

For best home performance the home's southern elevation should be oriented within 20 degrees of true South



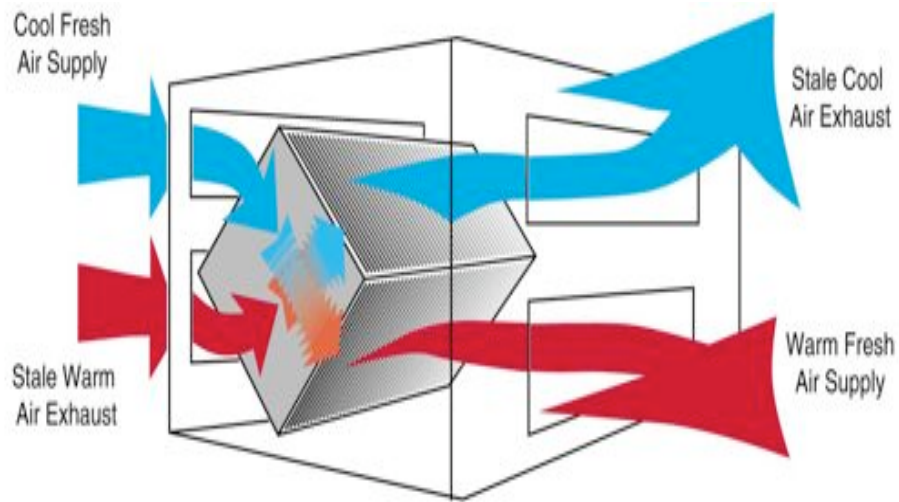
Zero Energy means that, on average, annual electric/gas bills will be near zero.

Designing Homes to Zero-Energy Goals

- Passive heating and cooling
 - Optimize south glass
 - Super-insulated structure – radiation, convection, conduction
 - Thermal mass
 - Proper ventilation and shading
 - Energy star LoE windows
- Efficient systems – 92%+ gas furnace, HRV, tankless water heater
- Efficient lighting & Energy Star appliances
- Active solar systems – PV, solar hot water



Systems: Heat Recovery Ventilation



Case Study: Toby's Lane Affordable Housing



Toby's Lane Affordable Project

- 8 Single-family homes on 1 acre, infill
 - Goal:
 - Affordable, LEED-certified homes
 - Passive solar design
 - Quality, super-insulated construction
 - Minimize sprawl
 - Broke ground in August, finished in December
 - Easily repeatable for future projects
 - Greater cost control
 - More projects per year

Toby's Lane Site Plan



Modular Multi-Family Projects



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[A Solar Village Home in a Day](#)