

Modular Homes are Naturally Green and Sustainable

John Connell – Design Director at Connor Homes

To suggest that prefab homes are green simply because they reduce waste is like saying insulation is a great way to reduce noise – it's only the proverbial tip of the iceberg! A primary indication of this fact is that both *USGBC and **NAHB award copious points in their respective green guidelines if a house is factory built. What do these two dominant green rating systems see in prefab?

Material Conservation

History has well established that a factory environment is ideal for minimizing waste of all sorts. Not only do modern computer programs optimize cutting and assembly schedules, but the minimized waste that remains is easily recycled because it is concentrated in one location. And since it never sees weather, little is lost to culling.

Additionally, because manufactured buildings are marketed in many states, they must be highly engineered to meet a range of codes. This means engineered wood becomes a favoured specification. Not only are these products well documented and highly recyclable, but they are fabricated almost exclusively from fast growth, plantation trees. This reduces logging pressures on old growth forests even as it cuts down on shipping.

In contrast, on-site construction typically fills local landfills with a generous stream of scraps, cut-offs and other building waste.

Energy Conservation

Energy savings occur initially during the manufacturing process and then, if the homes are properly designed, the savings will continue and increase for the life of the home. Since tight, well insulated homes are much easier to manufacture than to site build, demographers are seeing green homebuilders adopt this approach in record numbers.

Factory workers typically live within 5-15 miles of their facility which contrasts well with the longer commutes most traditional builders face; energy is saved. By concentrating all material deliveries to centralized locations with storage capacity, the amount of back-and-forth delivery to construction sites is dramatically reduced; energy is saved. Because a prefabricated house is closed to the weather within a few days, the amount of construction site heating is greatly reduced. And again, energy is saved.

With computer accuracy and assembly-line reliability, the manufactured house is generally tighter than a site built structure. Because the materials never sit in the weather, there is less warping which means a tighter end product. Better blower-door tests mean less energy usage for the life of the building.

Site Preservation

A traditional building sequence assumes massive site degradation during construction and then comprehensive remediation at the end. Anywhere from two to ten trucks will arrive daily, some of which are very heavy – concrete mixers, well drillers, cranes, and material deliveries. The ruts and concomitant erosion stemming from this traffic is largely eliminated at a factory where materials arrive at loading docks and the crew park in parking lots (not always the greenest lots, it must be said).

In addition to the erosion and habitat degradation, traditional sites are frequently despoiled by significant toxic spills, from leaking engines to spilled solvents. All of this is minimized in factories which must operate under health and safety laws.

The transports and cranes that deliver and place the prefabricated units are only on site for a day or two. Beyond minimizing physical damage, their brief stay means fewer disturbances to neighbours and community as well.

Health Quality Standards

Both builders and occupants enjoy better health standards when using factory based delivery. OSHA and similar worker safety ordinances publish and enforce standards for particulate matter as well as VOCs in factory atmosphere. On a traditional site, however, air and water quality is almost impossible to control and the introduction of dangerous materials is not uncommon. Besides the mould sown by using wet lumber, there are a host of other vectors for bad air and water. The recent use of corrosive gypsum board from China is only the latest to make headlines.

Life Cycle Costing (Durability)

Finally, a prefabricated house is usually more durable than a site built equivalent. A longer life means the embodied energy and carbon footprint are spread over the longest possible duty cycle.

Most everything that goes into a factory built house has a warrantee which is either passed onto the buyer or extended by the manufacturer. In contrast, a typical site built home is rarely guaranteed for more than a year.

And because fabricators typically sell in many states, they usually build to the highest standard in their region. It makes no financial sense to build different products for different states. As with any manufacturer, they are legally bound by their sales contract to meet or exceed all applicable codes, ordinances and laws.

Certainly there are green gradations in factory built homes with some being state of the art and others barely better than their site built siblings. But for an industry renowned for inertia, it is gratifying to see how quickly most manufacturers are greening their lines.

*John Connell serves as Design Director at **Connor Homes**, a company specializing in the design and manufacture of early American-style homes, in a process Connor Homes refers to as 'mill-built architecture'; allowing for the best of historical early American architecture, design aesthetic and details, coupled with the aforementioned benefits of factory built. Connell is the Founder of the Yestermorrow Design/Build School in Warren, Vermont, and author of Homing Instinct (McGraw Hill) and The Inspired House (Taunton) and Principal of 2morrow Studio*

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**National Association of Home Builders