

Consumer Workshops “Building & Home Expertise”

What is Green Building?

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- **What is a Green Home?**

Green buildings are sited, designed and constructed to reduce operating costs, increase building values and life spans, enhance the well-being of their occupants and support a healthy community and natural environment.

- **A green building begins with good design**

- **Good green design means reducing the harm the building does to the environment**
 - **Design for use of non-toxic, recycled or renewable materials; reduce the waste stream from construction**
- **Good green design also aims for high building performance—getting the most out of the building's systems and materials**
 - **Design to reduce energy usage by relying more on natural light and ventilation**
 - **Design for use of maintenance free materials on exterior; including siding, windows, doors, soffits and fascia**
- **Good green design focuses on enhancing building energy performance**
 - **Much of the energy and water supplied to conventional buildings is simply wasted**
 - **Design for use of high rated insulations, high efficiency HVAC systems, windows and doors**

- **What are the Benefits of Green Building?**
 - **Reducing energy and water costs save homeowners money and lessen overall energy and water consumption**
 - **Green building increases building values and maintain values for resale**
 - **Green building increases building life spans**
 - **People are healthier when their homes have proper ventilation and contain fewer toxic materials and substances**
 - **People flourish when their homes have more natural light and ventilation**
 - **Our environment benefits when homes and buildings use less energy and water, emit less contaminants and contribute less construction waste to landfills**

- **What are the Main Elements of Green Building?**
 - **Building Site**
 - **Start by selecting a site well suited to take advantage of the sun for heating, cooling and day lighting**
 - **Protect and retain existing landscaping and natural features**
 - **Landscape with native, drought-resistant plants and water-efficient practices**
 - **Reduce and recycle construction and demolition waste**
 - **Indoor Air Quality**
 - **Choose construction materials and interior finish products with zero or low emissions to improve indoor air quality**
 - **Materials Efficiency**
 - **Select sustainable construction materials and products that are high in recyclability, durability and longevity (esp. exterior products)**
 - **Use efficient dimensional planning and other material efficiency strategies. These strategies reduce the amount of building materials needed and cut construction costs (ex., design even lumber lengths)**
 - **Using engineered lumber and wood products can help protect old-growth forests**
 - **Use roofing materials with 40 or 50-year warranties for a longer lifespan**
 - **Using decking materials made of recycled plastic mixed with wood waste fibers can last up to five times longer than wood decking**

- **What are the Main Elements of Green Building? (Cont.)**
 - **Water Efficiency**
 - **Consider a dual plumbing system to use recycled water for toilet flushing or a gray water system that recovers rainwater or other nonpotable water for site irrigation**
 - **Install point-of-use hot water heating systems (tankless water heaters) for more distant locations**
 - **Use recirculating systems for efficient hot water distribution to distant locations**
 - **Reduce wastewater by using ultra low-flush toilets, low-flow shower heads and other water conserving fixtures**
 - **Use state-of-the-art irrigation controllers and self-closing nozzles on hoses**
 - **Building Science/Insulation**
 - **Energy Efficiency/HVAC**

■ **Building Science/Insulation (Cont.)**

- **Install high R-value wall and ceiling insulation and use minimal glass on east and west exposures**
 - **Ceiling insulation value should be a minimum of R-40**
 - **Wall insulation value should be a minimum of R-20**
 - **Design and install as many windows as possible on the south exposure (solar gain)**

- **Incorporate energy efficient framing techniques that include:**
 - **Warm corner exterior framing to allow cavity for insulation**
 - **Warm exterior wall to interior wall connection framing to allow cavity for insulation**
 - **Energy heels on roof rafters to allow for increased insulation over exterior wall plates**
 - **Frame headers for cavity to be insulated before drywall**

- **Install high R-value Low-E double pane insulated windows**

- **Install high R-value steel or fiberglass insulated doors**

■ **Building Science/Insulation (Cont.)**

- **Consider framing exterior walls with 2x6's to allow for higher R-value wall insulation**
- **Consider insulating the water heater and the water lines**
- **Make sure the attic is vented properly with adequate roof/gable vents and soffit vents to reduce attic temperature and improve air flow**
- **Consider insulating exterior basement walls, especially exterior walls above grade.**
- **Examples of building materials and their R-values:**
 - **Concrete** R-value of 1 per foot
 - **Wood** R-value of 1 per inch
 - **Fiberglass** R-value of 3 per inch
 - **Double Pane Window** R-value of 2 to 3
 - **Insulated Door** R-value of 10 to 12
 - **Foam Board** R-value of 4 to 5 per inch

- **Energy Efficiency/HVAC (Cont.)**

- **Passive design strategies can greatly affect building energy performance. These measures include building shape and orientation, passive solar design, and the use of natural lighting.**
- **Use a zoned heating/cooling system to greatly reduce heating/cooling costs by providing room or zone heating/cooling flexibility (unit zoning, damper zoning, after market damper zoning)**
- **Use a properly designed, sized and energy efficient heating/cooling system in conjunction with a thermally efficient building shell. Make sure the HVAC system has adequate heat and return air runs for comfort and efficiency.**
- **Consider installing a dual fuel HVAC system using a high efficiency heat pump and gas furnace for flexible fuel choices**
- **Use 90-94% high efficiency rated furnaces to greatly reduce heating costs and provide outside fresh air intake**

- **Energy Efficiency/HVAC (Cont.)**
 - **Use minimum 14 SEER high efficiency rated AC and heat pump units to greatly reduce cooling costs**
 - **Maximize light colors for roofing and wall finish materials**
 - **Install high-efficiency lighting systems with advanced lighting controls. Include motion sensors with dimmable lighting controls.**
 - **Install programmable thermostats**

- **What is LEED**

The LEED system (Leadership in Energy and Environmental Design) establishes standards that measure how green a building is. The LEED system scores a building's performance by awarding points for meeting detailed LEED standards.

- **The five major areas of performance are:**
 - **Sustainable site development**
 - **Water savings**
 - **Indoor environmental quality**
 - **Materials selection**
 - **Energy efficiency**
- **Based on the number of points a building earns, it can be awarded certification at one of four ratings:**
 - **Certified**
 - **Gold**
 - **Silver**
 - **Platinum (highest rating)**

- **Energy Tax Credits**
 - **Tax credits for consumers are available at 30% of the cost, up to \$1,500, in 2009 & 2010 (for existing homes only) for:**
 - **Windows and Doors**
 - **Insulation**
 - **Roofs (Metal and Asphalt)**
 - **HVAC**
 - **Water Heaters (non-solar)**
 - **Biomass Stoves**

 - **Tax credits for consumers are available at 30% of the cost, with no upper limit through 2016 (for existing homes & new construction) for:**
 - **Geothermal Heat Pumps**
 - **Solar Panels**
 - **Solar Water Heaters**
 - **Small Wind Energy Systems**
 - **Fuel Cells**

In summary, some important questions are: Should we invest more time, resources and energy in designing and constructing/remodeling our homes or businesses to be more “green” and energy efficient? Or, should we construct/remodel our homes or businesses using poor designs, low quality building products and low energy efficiency ratings? If we choose the latter of these two, we could possibly end up over time being very dissatisfied with the quality, performance and value of our home or business. We could also end up paying a larger dollar amount to continually maintain and operate our homes or businesses.

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