

# Roofing/ Exteriors

Green products and design for the roof and building exterior can greatly benefit overall building performance. Cool roofs and green roofs reduce building temperatures and the need for cooling, while solar panels on a roof can generate energy to fuel the rest of the building's energy needs. Using green products for exteriors can improve air quality and insulation, further reducing the need for heating and cooling, thus lowering utility bills.

## Cool Roofs

The easiest and quickest solution to combat the urban heat effect is simply to turn hot dark roofs into cool roofs by painting them with a basic coating of light-colored water sealant. In the same way that white clothing helps keep you cool in the summertime, white roofs reflect sunlight and heat.

- The Oak Ridge National Laboratory offers a free web-based calculator for determining the energy savings and the heating penalty for using a cool roof. It is available at [www.ornl.gov/sci/roofs+walls/facts/CoolCalcEnergy.htm](http://www.ornl.gov/sci/roofs+walls/facts/CoolCalcEnergy.htm).
- Look for the EnergyStar label to identify products that meet Energystar's program for cool roofs. The Cool Roof Rating Council also maintains a directory of cool roof products and specifies their reflectance and emittance. It is available at [www.coolroofs.org/ratedproductsdirectory.html](http://www.coolroofs.org/ratedproductsdirectory.html).

## Green Roofs

An even better alternative to cool roofs (albeit one that requires more time and effort) is to turn underutilized roof space into landscaped green roofs. Green roofs have the same cooling effect of white roofs. They also

- Provide amenity space for building users by replacing a yard or patio
- Increase roof life span
- Reduce stormwater run off
- Provide noise insulation
- Filter pollutants and CO2 out of the air
- Provide locally grown food (with roof-top vegetable gardens)
- Increase wildlife habitat in built up areas
- Reduce heating (by adding mass and thermal resistance value) and cooling (by evaporative cooling) loads on a building
- Reduce the urban heat island effect

More information on green roof materials and installation can be found at <http://www.greenroofs.org>. Information on the benefits can be found at <http://www.epa.gov/hiri/strategies/greenroofs.html>.

## Recycled Exteriors

Building construction and design should attempt to use recycled and sustainable materials for the roofing and exteriors.

### Metal Roofing and Siding:

- High embodied energy, but contain high amounts of recycled material.
- Lightweight, durable, low maintenance, fire resistant.
- Can be recycled again and again.

### Recycled Plastics:

- High recycled content, but limited in how many times it can be recycled.

### Recycled Asphalt Shingles:

- These products are being developed, and are a good use of otherwise discarded material, but are still not a preferred sustainable product.

# Roofing/ Exteriors

## Roofing and Wall Panels

- These types of products employ materials similar to those mentioned above, manufactured into larger panels or entire systems that speed production and installation. Recycled metal or plastics are rolled or formed into shapes that often mimic the size and texture of wood products.
- A variety of wood products use wood fibers and other byproducts from waste, recycled or managed sources to produce various types of sheathing or finished siding. Care should be taken when specifying these materials because some may off-gas toxins, such as formaldehyde, from their binding agents. These engineered wood products are more resource efficient and durable than solid wood.
- Preassembled, pre-manufactured panelized systems combine finished cladding, substrate, insulation and even structural components into a single product shipped to the jobsite ready for installation.
- Sandwich panels made up of a rigid insulation core bound by oriented strand board sheathing have good structural, thermal, and vapor transmission qualities. While these characteristics may support sustainable strategies, it is important to evaluate them in terms of the environmental impact of each component and the assembly process to fully comprehend their green-product status.

## Low-Slope Roofing

- Typically a commercial application, low-sloped roofing can be a major player in the thermal performance as well as provide moisture protection. It is important to avoid polyvinyl chloride (PVC) based products when selecting low-sloped roofing. Notwithstanding its dangers during the manufacturing process, it is a derivative of petroleum that also will breakdown and become brittle with exposure to ultraviolet radiation from the sun. Even with the introduction of so-called UV stabilizers, PVC-based materials will eventually harden and crack and need replacing, often within 10 to 20 years.

## **Solar Incentives**

The Los Angeles Times reported that "for every utility-bill dollar saved annually because of an improvement, a homeowner gains about \$20 in property value. So if solar cuts the annual electric bill by \$1,000, the owner could gain \$20,000 in home value."

The California Solar Initiative offers cash incentives on solar systems - currently, \$2.50 a watt. California Solar Initiative incentives, combined with federal tax incentives, can cover up to 50% of the total cost of a solar system. See

[http://www.gosolarcalifornia.ca.gov/csi/commercial/cash\\_back\\_business.html](http://www.gosolarcalifornia.ca.gov/csi/commercial/cash_back_business.html).

## Solar Energy Resources

- California Consumer Energy Center provides information on rebates, energy conservation and efficiency: <http://www.consumerenergycenter.org> .
- California Energy Commission's Go Solar California: <http://www.gosolarcalifornia.ca.gov> .
- The Los Angeles Department of Water and Power provides information on residential rebates: <http://www.ladwp.com> .
- Pacific Gas & Electric: <http://www.pge.com/solar>
- San Diego Regional Energy Office: <http://www.energycenter.org>
- Southern California Edison's solar incentives: <http://www.sce.com/rebatesandsavings/californiasolarinitiative>