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Build a 'Cool' Roof

On residential and commercial buildings alike, cool roofs offer major economic and environmental incentives. Consider using green materials in order to take advantage of both, keeping energy costs low and roofing quality high.

By Matt Alderton


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In the past, the only way to make a home 'green' was to paint the walls. These days appliances, plumbing and lumber can all be green--as in environmentally friendly--and you can add roofs to that list as well.

So-called "green roofing" is on the rise, according to roofers like Grant Suelzle, vice president of URM Contracting Inc., a Carson, Calif.-based roofing company. The California Energy Commission has made green roofing prescriptive for all nonresidential buildings in the state, fueling demand through regulation, he says.

Outside California, demand for green roofs is largely being driven by cost and conscience; consumers want to save money and, if possible, do something good for the planet in the process. Cool roofs, in particular--green roofs that use reflective materials to reduce buildings' energy demands--promise to help them do both.

Sky-High Benefits

Recognizing a shift in social perspectives, smart builders are changing both their posture and their products, according to Suelzle. "We personally gave up doing all hot asphalt roofing five years ago," he says. "We've been doing solely green roofing ever since."

When roofers turn their backs on traditional tar-and-gravel systems, Suelzle continues, customers, contractors and communities benefit.

The incentives to have a green roof are most pronounced for homeowners, according to Misha Sarkovich, program manager for the Sacramento Municipal Utility District, a public utility in California that began offering rebates for buildings with cool roofing technology in 2001. Green roofing materials are pricey at the outset, Sarkovich observes, but they tend to pay for themselves in long-term savings -- especially in warmer climates.

"You reduce air conditioning costs by having a cool roof," Sarkovich says, adding that homeowners enjoy an average of 20 percent savings. "A conventional flat roof on a hot summer day would have a surface temperature of 180 degrees Fahrenheit; a cool roof on the very same building on the very same hot summer day would be about 130 degrees. By reducing the roofing temperature, you reduce air conditioning costs significantly."

Green roofing has other advantages, too. Next to reduced energy bills, Sarkovich says cool roofs:

- Reduce wear and tear on HVAC systems, which must work harder to cool hot buildings.
- Are less prone to thermal degradation, therefore lasting several years longer than traditional built-up roofs.
- Are less likely to leak since they have fewer seams.
- Offer increased comfort, even in buildings that lack air conditioning.
- Create cool neighborhoods, as they reduce the "urban heat island" effect that causes high temperatures in heavily populated areas.
- Lower communities' energy demands during peak cooling periods.
- Help reduce pollution, since heat is a precursor to smog.
- Reduce waste, because longer-lasting roofs stay on houses and out of landfills.

Cool Roof Components

Although there are several types of green roofs, including vegetation roofs (on which tenants can grow gardens) and solar roofs that generate electricity, perhaps the 'hottest' roofs for green builders are 'cool' roofs built with light-colored materials that reflect heat rather than retain it.

"Cool roofs have two properties: high reflectivity and high emissivity," Sarkovich says. "Emissivity is a property of the material to emit energy so that it does not retain heat. Reflectivity is the ability to reflect solar energy back into the atmosphere."

In roofing products, both reflectivity and emissivity are rated on a scale from 0 to 1; the higher the rating--and the lighter the color--the cooler the roof.

The best green roofing product for your project depends not only on the product's properties, however. It also depends on the slope of your roof. Consider, for instance, the following recommendations:

- **For flat roofs:** These roofs tend to be more common on commercial buildings than residential ones, and Suelzle suggests one of two products. He recommends either single-ply membranes, which are ideal for new roofs, or cool roof coatings, which are best used on existing roofs. The former consists of pre-fabricated plastic or rubber sheets that are applied in a single layer with minimum seams; the latter are either rolled or sprayed on like paint in thick liquid coats. A third option, according to Sarkovich, is sprayed polyurethane foam (SPF), which provides extra insulation and should be used in combination with cool roof coatings.
- **For sloped roofs:** The greenest materials for the sloped roofs that are common on most homes are roof tiles, made of either concrete or clay, or coated metal. Both materials are manufactured in special pigments that allow homeowners to choose from a variety of colors, in case they're concerned about the aesthetic appeal of the bright white roofs that are typical of many cool roofing systems.

Whether you specialize in flat roofs or sloped ones, Sarkovich concludes, an environmentally friendly roof is, without question, a great idea. "They'll have happier customers," he says of contractors who build cool roofs, which is a good reason to put away the asphalt shingles.

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Green and Cool Roofing Resources

- [Cool Roof Rating Council](#)
- [ENERGY STAR Roof Products](#)
- [Environmental Protection Agency](#)
- [Lawrence Berkeley National Laboratory](#)
- [Reflective Roof Coatings Institute](#)
- [Sacramento Municipal Utility District](#)

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