



## Cool Roofing: More than a Black and White debate

### Urban heat island effect trumping insulation arguments, even in cold climates

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Energy efficiency is likely to be a simmering issue as August's massive power outage promises to spark widespread debate over enacting an updated national energy policy. And while reflective, cool roofing surfaces remain a hot trend-especially in warm-weather climates-the goal of conserving structural cooling costs seems shrouded in shades of gray as the country strives for viable energy-use solutions.



Black EPDM or white TPO -- both can be part of an energy efficient roofing system. (RSI illustration by Joe Kalinowski)

"The issue is not as stark as black and white," says Jared O. Blum, president of PIMA, the Polyisocyanurate Insulation Manufacturers Association. "There needs to be a hard look at this concept," he contends. "There needs to be much more debate about the issue of reflectivity" and its ultimate impact.

Rather than focusing on the color of a membrane, Blum believes that a building's entire roofing and insulation system should be taken into account when choosing the most appropriate application for a particular structure in a given climate.

"There needs to be a system approach, not a color approach," says Blum. "There certainly are parts of the country where reflectivity makes sense," he acknowledges, "but I have a concern that architects and specifiers are misconstruing" the suitability of cool roofing in colder climates where winter heating costs play a larger role in energy consumption than does summer cooling.

"Light colors do have a tendency to reflect (heat from a roof's surface), but has the concept been over-sold to the construction marketplace?" Blum ponders. "Reflectivity is only in effect when the sun is out," he says, referring to northern portions of the country where cloud-cover is more prevalent than summer's searing heat. "You have nine other months that you have to deal with," Blum explains. "I think there are legitimate differences over how far reflective roofs can take you."

The standards of the Environmental Protection Agency's (EPA's) Energy Star program tend to exclude roofing systems that still make perfect economic and environmental sense, says Blum. "EPDM can be made to be reflective," he observes, adding that a structure's insulation is likely to play a larger role in energy consumption. "You must think about your insulation value for 52 weeks a year-and thermal performance will work for you 52 weeks a year."

A new trade association is being formed to address these issues from an industry perspective. Due to be up and running sometime this fall, the mission of the Solar Smart Roof Alliance (SSRA) will be "to educate policymakers and the construction marketplace about the environmental, performance and economic issues when considering the use of a reflective roof."

The organizations on board with the new SSRA thus far include the EPDM Roofing Association (ERA), the Asphalt Roofing Manufacturers Association (ARMA), the Alliance for the Polyurethanes Industry (API), the North American Insulation Manufacturers Association



(NAIMA), the Roof Coatings Manufacturers Association (RMCA) and the Spray Polyurethane Foam Alliance (SFPA).

**Where are the benefits?** "You can get more energy efficiency by adding insulation than you can by changing the color of the roof," says Tom Bollnow, senior technical director for the National Roofing Contractors Association (NRCA). The association has not yet formed an official position on the issue, although its Energy Conservation and Environmental Issues Task Force is studying the matter.

Government bodies are adopting the EPA Energy Star standards into construction codes, and often these decisions are being made without reviewing all the pertinent factors.

"Municipalities are thrusting these same tenets on the country as a whole," says Bollnow. "The benefits are lessened in northern climates."

Were light-colored roofing to become the law of the land "it would eliminate a whole portion of the roofing industry," Bollnow warns. Black EPDM and modified bitumen systems could be threatened.

"Coal tar pitch is still a valid roofing system in certain areas," he notes. "We have coal tar pitch roofs in this area (Chicago) that are 30- to 40-years-old and still performing."

The Energy Star program would be more meaningful if R-values were included in the rating process, according to Nick Shears, vice president of sales and marketing for Carlisle SynTec Inc. "We're the largest supplier of white roofing in the country, so we can be objective about the topic of roof membrane reflectivity and the energy efficiency of roofs," he explains. One issue that Energy Star should address is the impact of accumulated dirt on a cool roof's surface. "Light colored roofs are going to get dirty, and owners are not going to go up there and clean them, as allowed in the Energy Star program."

**Chicago blues** The Chicago Roofing Contractors Association (CRCA) has been struggling mightily to change a proposed city energy code that mandates Energy Star standards. CRCA has helped delay implementation of the measure, yet concern still remains over the implications if the code's content is not changed before then.

"There are a lot of old buildings in Chicago that are not going to be able to comply with Energy Star," says Rodney P. Petrick, second vice president of the CRCA. "It's expensive to re-engineer some of these old buildings," adds Petrick, who also is vice president at Ridge-worth Roofing Co. Inc. of Bridgeview, IL.

Buff-colored shingles for homes is another requirement of the proposed Chicago energy code, and Petrick predicts that area homeowners will balk at the mandate: "The consensus of John Q. Public will play a part."

Petrick is particularly peeved that the Chicago measure offers no incentives for compliance by building owners-only unpleasant consequences if the law is not followed. He would like to see solid incentives built into Energy Star, along with a system of designated national districts that would apply differing climate conditions for meeting the Energy Star ratings.

"The weather in the LA Basin area is not the same as we have here in Chicago," Petrick points out. "We have to get the ear of the U.S. Dept. of Energy and change the Energy Star program."

"Chicago is a "wash" from an energy perspective," concedes Andre Desjarlais, group leader for building envelope research at the U.S. Department of Energy's Oak Ridge National Laboratory. "It's obviously a win-win in Phoenix. The savings are less in cooler climates. But that's not the driver-the driver is the environment."

"There are other side-car issues associated with cool roofs that people tend to forget about," Desjarlais declares. "Cool roofs do other things besides save energy." Cool roofs help reduce air pollution by lowering the temperatures in urban heat islands, he explains, pointing to Chicago, where hundreds died several years ago during a heat wave.

Desjarlais discounts contentions that cool roofs actually deflect the reflected heat into neighboring structures-therefore raising cooling costs. Science has debunked that argument. "That's a grasping-at-straws issue," he says.

Roofing bears the brunt of the government's attention because cool pavements are much more expensive, Desjarlais explains. "The cost for changing is less" with roofing systems."

However, EPA thus far shows little interest in adjusting Energy Star. Climatic districts will not be formed and there will be no incentives offered, says Steve Ryan, Energy Star's program manager for roofing. "That's not part of the Energy Star mission," Ryan says. "We don't do incentives at the government," he adds.

"It's a pollution issue and an energy issue-even in northern climates," Ryan states. If you have a black roof with insulation it's still not doing anything to reduce the urban heat island effect."