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EPDM group challenges finding of roofing study



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Workers install a Firestone RubberGard R.M.A. System, an EPDM roof. Firestone, like most of its fellow members of the EPDM Roofing Association, makes both EPDM and TPO roof membranes.

BETHESDA, Md.—The EPDM Roofing Association is challenging a study conducted by Lawrence Berkley National Laboratory, which recommends policy makers phase out black EPDM roof membranes because they pose a public health risk.

The LBNL's study, “Economic comparison of white, green, and black flat roofs in the United States,” compared black, white and green roofs during a 50-year analysis to see which of the three is the most cost-effective.

LBNL took 22 case studies—some are averages of multiple roofs and projects—that consisted of some form of energy savings data. To qualify for the LBNL's study, the case study must compare some combination of these three roofing types.

LBNL ultimately concluded that both white and black roofs were significantly more cost-effective than green. White did not beat out black by a large margin—resulting in a net savings of just \$2.40 per square foot over 50 years.

Despite stating its study is purely an economic comparison, the LBNL recommended in its discussion section that “the fact that the large public health advantages of green or white roofs over black roofs cannot be incorporated into an economic analysis indicates that private actors will not always make the socially optimal roofing choice. This presents a strong case for public policy to intervene by phasing out black roofs in locations with hot summers.”



“That blew us away,” said Mike DuCharme, director of product marketing at Carlisle Syntec. “We went back and reviewed a New England Journal of Medicine article, and there is no mention of black or white roofs in it. In our review of that article, we found that it indicated seniors or disabled folks would be more impacted by a heat wave. That article recommended precautions be taken in looking after seniors and the disabled during a heat wave.”

The article the ERA reviewed was the same article cited in the LBNL's study—“Heat-related deaths during the July 1995 heat wave in Chicago”—to support its health risks claim. The LBNL also cited a study examining a 2003 heat wave in Europe. However, neither study examines or concludes that the roof membrane played a roll in the deaths resulting from either heat wave.

The New England Journal of Medicine article said more than half of the victims it examined lived on the top floor of a building, but did not specify the type of building or roof membrane. When the article was cited in the LBNL's study, it included a parenthetical “beneath a black roof” in a footnote.

Ben Mandel—research assistant at LBNL, and one author of the study—said in 1995 nearly all apartment buildings in Chicago and the U.S. had black roofs.

“It's not explicitly stated that black roofs were a cause of death, and we wouldn't say that either, but it doesn't take too much of a logical leap to understand that the darker the roof is, the more sunlight it absorbs, the more heat it's going to conduct into the space below it,” Mandel said.

The ERA also claims that evidence supporting black roofs went largely ignored in the LBNL's study—specifically the heating penalty for a white roof in winter climates. While white membranes offer cooling benefits in the summer, the ERA said that much of that is offset by a heating penalty in the winter.

While Mandel said the heating penalty would not completely counter the cooling benefits, he acknowledged that this was an area the study could expand upon.

He said the reason the penalty was not included was because the case studies they examined did not report those figures in their analysis.

“It would definitely make it closer to parity, there is no question,” Mandel said. “That is something we had hoped to include in the paper. I think that's definitely fair game for future research to find a fair value.”

DuCharme said that in the ERA's analysis, the group found that the roofs the LBNL selected were largely anecdotal. In his review of the data, he noted the study had some EPDM roofs costing as high as \$24 per square foot and some white roofs as low as 20 cents per square foot, which he described as “insane.”

“Twenty-two roofs, even if they were very scientifically collected, would not be adequate,” DuCharme said. “If they had 100 or 200 roofs, that would start to smooth out some of the bias. And they would have to do



steer the market away from a single-component solution. Usually, ERA members are selling an entire roof system, not just the membrane. He said energy efficiencies will be impacted by the air barrier and the insulation in addition to the roof membrane, not from just one element of the roof.

“Most of us have a foot in both sides of the camp, so we're large producers of white and black membranes,” DuCharme said. “I think we have a pretty balanced outlook on this, but this study is just so biased overall. It really got our radar up and made us dig substantially deeper.”

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