

BANGOR DAILY NEWS

What Maine needs to know about the myth of white roofs



Seth Koenig | BDN

Firefighters on a Windham-based tower truck attempt to break through the roof of a Fort Hill Road structure in Gorham recently.

By Marc N. Boulay and William O'Neill, Special to the BDN
Posted April 04, 2014, at 7:35 a.m.

A misguided and flawed [federal government initiative](#) could be costing Bangor residents and business owners untold dollars in wasted energy costs — and in a small way contributing to global warming.

Maine home and business owners are being told they should use white roofs as the standard in construction of new homes and buildings. White roofs are mandated in some parts of the U.S. and promoted as an energy-efficient means of reducing air-conditioning costs, which is absolutely true.

However, what often goes unmentioned is that there is a heating penalty associated with the use of white roofs in northern cities such as Bangor.

In southern locales, the bulk of a building's energy bill is attributed to air-conditioning costs, and thus, a reflective white roof can be used effectively to [lower energy usage](#). But in northern climates such as Maine, where the energy used to heat a building is many times greater than energy used on air-conditioning, a reflective white roof can notably increase energy usage and overall costs.

There also is the claim that white roofs reduce "heat island effect," ignoring pertinent factors such as the relatively smaller footprint of rooftops in comparison with black roads and parking surfaces, reflective heat gain attributed to reflective glass structures and interruption of wind flow which acts to move such heat away from the black road surfaces and human activity. The proponents of white roofing take it a step further and theorize that reducing the heat island effect will somehow address global warming.

A [2011 study](#) at Stanford University showed that white roofs may actually increase, not decrease, the earth's temperature. White roof membranes have high reflectivity that directs heat upward into the atmosphere and then mixes with black and brown soot particles, which are thought to contribute to global warming.

With additional energy use attributed to the use of more energy to heat buildings with a reflective white roof, we believe that a reflective roof in a northern climate such as Bangor is actually counter-productive in the push to reduce carbon dioxide emissions.

And if Bangor's homes and buildings use more energy for heat, then it follows that they are causing more carbon dioxide emissions.

In 2010, the Obama administration began requiring cool roof installations on all Department of Energy buildings. The idea took hold and spread like wildfire through programs such as the [Leadership in Energy and Environmental Designs](#) building rating system, a system for measuring energy efficiency.

Unfortunately, engineers, architects and builders often were not consulted when flawed ideas arose out of these programs.

But these professionals are speaking out.

Harboring a narrow mindset that "white roof membranes equal energy efficiency" disregards many factors that contribute to energy efficiency, including insulation, and limits roof options available to the design professional, and precludes nonreflective roof systems that have proven to be highly sustainable.

Given all of these factors, the use of a dark roofing membrane in the Bangor area is typically the most energy-efficient, environmentally friendly, cost-effective and sustainable option. A common-sense approach would be for politicians, building code officials and leaders to require that the proponents of white roof systems substantiate their energy efficiency properly using the [ENERGY STAR roof savings calculator](#).

Unless the building is a hockey rink, cold storage facility or some other unique building type, the darker-colored roof system will prove out to be the more energy-efficient application.

Marc N. Boulay is chief engineer of Northridge Consulting Engineers in Centerville, Mass., and William O'Neill is president of Building Envelope Management Inc. in Hull, Mass.

<http://bangordailynews.com/2014/04/04/opinion/contributors/what-maine-needs-to-know-about-the-myth-of-white-roofs/> printed on May 23, 2014