



Energy COOL: White Roofing as Silver Bullet to slay Global Warming?

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Reflective roofing has long seemed one of the best geoengineering options to help turn the rising tides of Global Warming. An opportunity to reduce energy use through reduced cooling demand and longer lasting roofs, to improve urban life (and cut energy requirements) by reducing urban heat island impacts, and to contribute to fighting global warming by reflecting solar radiation back into space.

It seems, however, that this opportunity might be even greater than previously believed. Global Cooling: Increasing World-wide Urban Albedos to Offset CO2 (pdf) suggests that white roofing of just 100 cities could halt Global Warming temperature increases for a decade or more.

This study comes from some of the nation's top expert groups in roofing, from the Heat Island Group at Lawrence Berkeley National Laboratory which focuses on this serious urban challenge:



"Heat Island research is conducted to find, analyze, and implement solutions to the summer warming trends occurring in urban areas, the so-called 'heat island' effect. We currently concentrate on the study and development of more reflective surfaces for roadways and buildings."

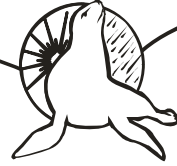
And, the impact of our asphalt roofs, dark shingles, and other absorptive surfaces are huge.

Take a moment to conceptualize this in your own way.

Mine: consider walking barefoot onto a road on a hot, sunny, summer day. Ouch! Doing a ballet of quick steps, trying to keep from broiling the feet, sweet relief when on a painted white line or getting to a white concrete curb. Even when not actually on the blacktop, think about standing by the side of the road, feeling the wave of heat rising

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from the blacktop. It is not hard to visualize the heat collected by low albedo (that means low reflective) surfaces.

Another image: School buses increasing have white roofs. Why? To reduce the heat load within. This saves fuel (air conditioning) and reduces the sweat load for kids within. Energy (financial) savings and improved comfort. A win-win space.



And, just as moving from blacktop to white line or asphalt to concrete provides a comforting drop in temperature, so too can changing roofs / surfaces create a real change in the amount of solar radiation captured by man-made structures.

According to Global Cooling,

a 1,000-square-foot roof -- the average size on an American home -- offsets 10 metric tons of planet-heating carbon dioxide emissions in the atmosphere if dark-colored shingles or coatings are replaced with white material.

Consider that. Per 100 square feet moving from traditional heat-absorbing shingles to reflective, high-albedo roofing is an offset of a ton of CO2 emissions.



Globally, roofs account for 25% of the surface of most cities, and pavement accounts for about 35%. If all were switched to reflective material in 100 major urban areas, it would offset 44 metric gigatons of greenhouse gases, which have been trapping heat in the atmosphere and altering the climate on a potentially dangerous scale.

That is more than all the countries on Earth emit in a single year. And, with global climate negotiators focused on limiting a rapid increase in emissions, installing cool roofs and pavements would offset more than 10 years of emissions growth, even without slashing industrial pollution.

This is quite impressive and a path that almost certainly is worth pursuing ... even aggressively.

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To be clear, simply addressing temperature will not deal with all of the challenges related to CO2 emissions. For example, reflective roofing would do nothing relative to the acidification of the oceans and this threat to ocean (and human) life. But, the temperature impact in terms of cooling could be quite important in helping to create breathing space as humanity lowers its carbon footprint through reduced energy use combined with ever-more low/no-carbon energy sources.



The core geoengineering principle should be:

win-win-win. A proposal that, in a systems of systems effort, provides multiple wins and does not solely address temperature. Thus, a proposal that offers real potential for improving economy, reducing carbon, and contributing to reduced temperature (both directly, somehow, and indirectly through reduced carbon loads or carbon capture) would seem to merit greater prioritization than high-cost efforts that would solely impact "temperature" but not impact (or worsen) the carbon load equation.

And, reflective roofing certainly is in this space. Reflective roofs reduce energy costs, with the 'payback' period for the additional cost of a reflective roof over traditional asphalt sometimes as short as a few weeks due to significantly reduce air conditioning loads. As well, if the air conditioning is on (or near) the roof (as many are), this will further save energy by making these systems that much more efficient. In addition, there is reduced maintenance costs as reflective roofing requires less maintenance as they have lower temperature extremes and swings during the year, thus lasting longer..

A reasonable place to start for more information the [Energy Star page](#) on reflective roofing.

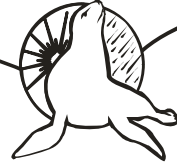
Americans spend about \$40 billion annually to air condition buildings -- one-sixth of all electricity generated in this country. Why choose ENERGY STAR reflective roofing for your building?

* ENERGY STAR qualified roof products reflect more of the sun's rays. This can lower roof surface temperature by up to 100F, decreasing the amount of heat transferred into a building.

* ENERGY STAR qualified roof products can help reduce the amount of air conditioning needed in buildings, and can reduce peak cooling demand by 10-15 percent.

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Consider that.

And, of course, this moves beyond the savings on the specific building when we look to reflective roofing on a large scale,

"I call it win-win-win," Akbari said. "First, a cooler environment not only saves energy but improves comfort. Second, cooling a city by a few degrees dramatically reduces smog. And the third win is offsetting global warming."

Some questions to consider

- What color is your rooftop?
- What color is your employer's rooftop?
- What color are local government rooftops?
- Are you ready to advocate reflective roofing as a win-win-win solution in your home, community, business?

Here is an Energy Smart change that could have a major impact ... quickly. It is time to Get Energy Smart! NOW!!! And, on our rooftops might be a good place to start.