White roofs, streets could curb global warming

September 17 2008, by Lisa Zyga

The idea of painting our roofs and roads white to offset global warming is not new, but a recent study has calculated just how significantly white surfaces could impact greenhouse gas emissions. Last week, researchers at Lawrence Berkeley National Laboratory and UC Berkeley presented their study at California's annual Climate Change Research Conference in Sacramento.

If the 100 largest cities in the world replaced their dark roofs with white shingles and their asphalt-based roads with concrete or other light-colored material, it could offset 44 metric gigatons (billion tons) of greenhouse gases, the study shows. That amounts to more greenhouse gas than the entire human population emits in one year, according to a recent article in the Los Angeles Times. The strategy could also offset the growth in carbon dioxide emissions, which account for about 75% of greenhouse gases, for the next 10 years.

The reason for white is simple: white reflects the sun´s rays more than black does. The study´s coauthor, LBNL physicist Hashem Akbari, explained that it takes about 10 square meters of white roof to offset 1 metric ton of carbon dioxide. In warm climates, white roofs have the additional benefit of lowering the cost of air conditioning by up to 20% in hot months.

It´s this second reason of reduced cooling costs that prompted the state of California to require in 2005 that flat-roofed commercial buildings have white roofs. In 2009, the state will require that new and retrofitted

residential and commercial, with both flat and sloped roofs, be installed with heat-reflective roofing. The requirements are part of California´s energy-efficient building code.

Globally, roofs account for about 25% of the surface of most cities, and pavement accounts for about 35%. Even without cutting industrial pollution from current levels, installing white roofs and pavements could offset more than 10 years of emissions growth, according to the conference data.

Economically, the scientists estimate that white roofs and roads could save billions of dollars per year in reduced carbon dioxide emissions. Besides offsetting global warming and reducing cooling costs, white surfaces offer a third benefit: they could cool a city by a few degrees, which dramatically reduces smog.

The LBNL physicists plan to work with the United Nations to persuade the world´s major tropical and temperate cities to adopt white roofing and pavement strategies.

Akbari, along with coauthors Surabi Menon of LBNL and California Energy Commissioner Arthur Rosenfield, will publish the study, called "Global Cooling: Increasing Worldwide Urban Albedos to Offset CO2," in an upcoming issue of the journal Climate Change.

More information: Global Cooling Presentation

via: Los Angeles Times

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