



# Cool Metal Roofing

**B**uilders and architects are changing the way they select building materials and design for energy performance. The roof can have the greatest impact on the energy use of a building. Coatings and finishes available today qualify metal as a recognized cool roof product.



*Metal Roofing--  
cool and sustainable*



**Buildings consume one-third of all energy and two-thirds of all electricity generated. Cool roofs can help reduce energy consumption by lowering cooling loads. Lightly colored, more reflective roofs save up to 40% in cooling energy, as reported by the Heat Island Group of Lawrence Berkeley National Laboratory. Highly emissive roofs can lower urban air temperatures, thereby benefiting the environment by reducing smog formation.**

**Metal roofing has many attractive features. Its architectural appeal, variety of profiles, textures and color, flexibility, and durability make it popular for residential and commercial projects, both in low-slope and steep-slope applications. Metal roofing and its finishes are inert, safe materials that don't pose a health risk. Metal roofing is tested for wind, fire, and hail resistance, and listed with various building codes and entities. Its non-combustibility can reduce the spread of fire in and among buildings.**





*Metal roofing is the choice for a cool roof.  
For more information about its energy efficiency, visit  
[www.coolmetalroofing.org](http://www.coolmetalroofing.org)*

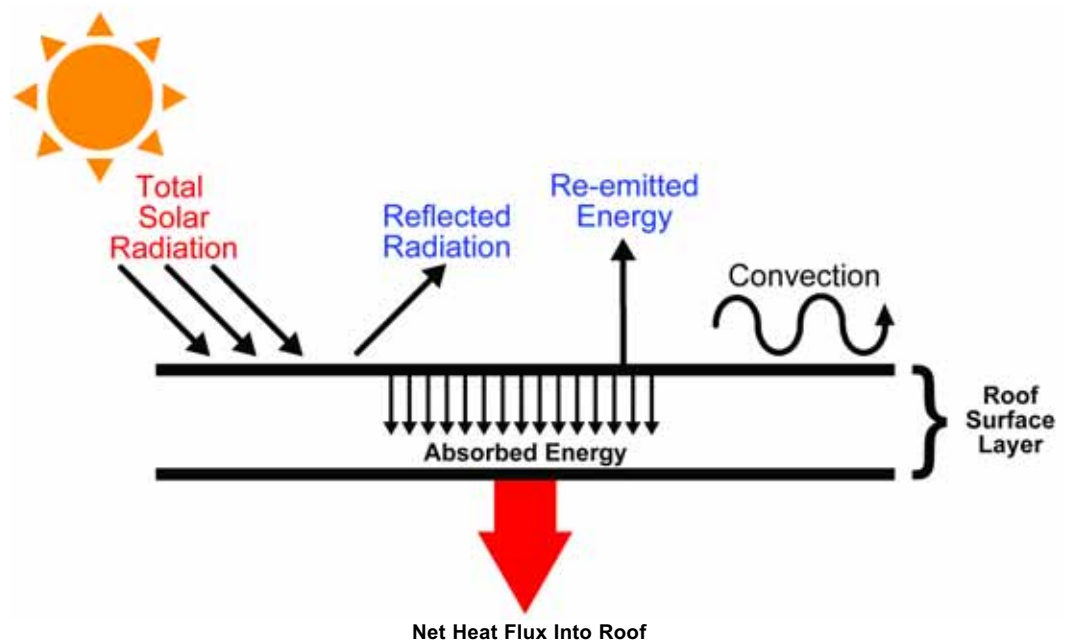
## ENERGY EFFICIENCY

A building's cooling and heating costs can be effectively reduced by insulation under the roof surface. Adding increasing amounts of insulation is not always the best way to save energy. As part of total system design, a cool metal roof can be an economical method for better energy efficiency.

Cool metal roofing is available unpainted, with oven-baked paint finishes, or with granular-coated surfaces. This family of roofing can achieve solar reflectance of over 70 percent. Reflected solar energy allows the roof surface to remain cooler, which means less heat is transferred into the building.

The infrared emittance of a roof is a measure of absorbed solar radiation that is re-emitted from the roof surface to the sky. Emittance of metal roofing varies with the surface finish. Emittance of painted or granular-coated metal roofing can be as high as 90 percent.

Where annual cooling loads dominate, a highly reflective and highly emissive painted or granular-coated metal roof is optimal for reducing energy consumption. Where annual heating loads dominate, an unpainted metal roof is more desirable because of its low infrared emittance.



**The Florida Solar Energy Center found that metal roofing...**

**"...saves the most energy as a result of its high reflectance and superior ability to cool quickly at night."**

**Metal roofing was reported to save a Florida homeowner about 23% annually in cooling costs, compared to a dark gray asphalt shingle roof.**



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## MITIGATING THE URBAN HEAT ISLAND EFFECT

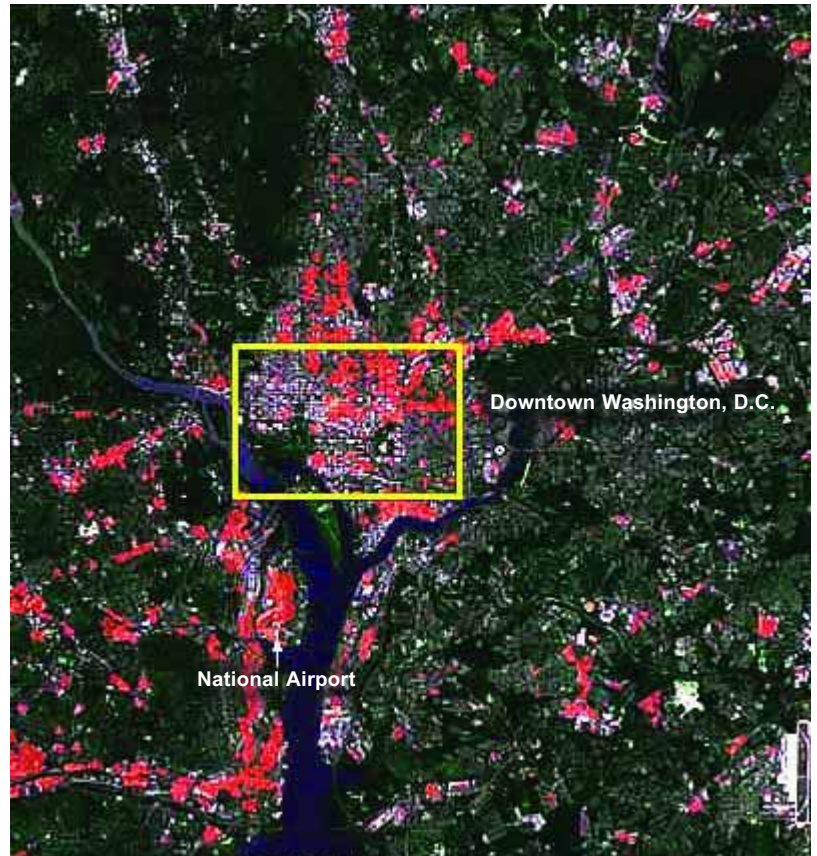
About half of the North American population lives in urban areas. The prevalent use of energy-absorbing, dark building materials and dark pavements, coupled with a lack of vegetation, creates a microclimate where ambient temperatures are higher than in the surrounding areas. For some cities, this urban heat island effect can increase the local temperature as much as 12° F (7° C).

Cool metal roofing is one way to mitigate the urban heat island effect. Roofs with higher reflectance have lower surface temperatures, which help reduce ambient air temperatures. This improves air quality since less smog is formed. Also, air pollution associated with burning fossil fuels at utility plants is reduced because of less peak load demand.

Oak Ridge National Laboratory research has shown that metal roofing retains solar reflectance over time better than other roofing products because it resists the growth of organic matter and sheds dirt more readily than other materials.

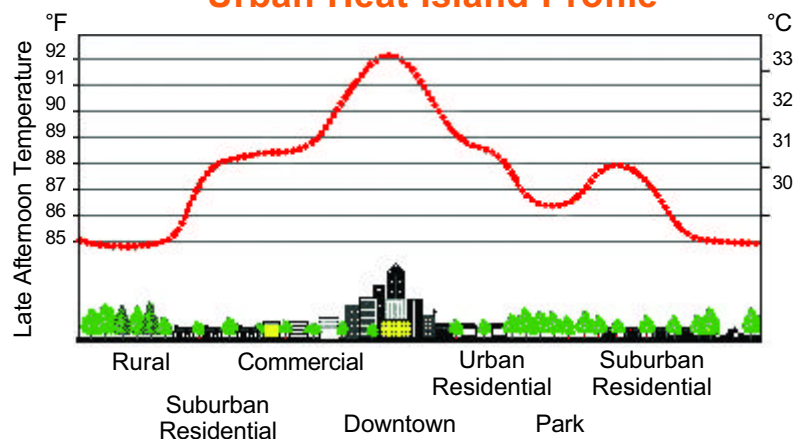
Metal roofs are included on the U.S. EPA's Energy Star Roof Products Program. Metal roofs are also represented on the California Energy Commission's Cool Roof Savings program listing.

Systems for World Surveillance



Hottest surfaces colored in red

### Urban Heat Island Profile





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## SUSTAINABILITY



In addition to being energy efficient, metal roofing is recognized as a sustainable building material for several other environmental reasons. And, as a "green" building product, metal roofing is rightfully becoming more popular in the architectural community.

**Durability** - Metal roofing is known for its resistance to weather, including wind, hail, ice, and snow. It is less affected by hot-cold and wet-dry cycles that destroy other materials. Commercial metal roofs have been in service 30 years or more. Painted roofs are credibly warranted up to 30 years.

**Recycled Content** - Metal roofs typically have a minimum of 25% recycled content. This level of recycled content allows metal roofing to be routinely included on listings for "green" and recycled content products. This is especially important since the U.S. Green Building Council program for certification of green buildings, Leadership in Energy and Environmental Design (LEED)<sup>®</sup>, awards either one or two points for the weighted total recycled content of all materials in a project. Metal roofing is a solid contributor toward one LEED point and may help gain a second one.

**Recyclability** - Metal roofing is also 100% recyclable when ultimately removed as part of building renovation or demolition. Other roofing materials are routinely removed and disposed of by the ton in landfill, but metal roofing can be recycled in its entirety. Metals are exceptional building materials that can credibly claim both recycled content and recyclability by recognized definitions.

**Low Weight** - Depending on the specific product chosen, the weight of metal roofing is one-third to as little as one-eighth that of conventional roofing shingles. This lower weight produces less static and dynamic loading on the structure and thus can allow for metal roofing to be installed over old roofing material without requiring demolition removal.



**Developed by the Cool Metal Roofing Coalition**

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For more information, visit: [www.coolmetalroofing.org](http://www.coolmetalroofing.org)

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