

# Do Metal Roofs Save Energy?

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The popularity of metal roofs has soared in recent years because of their durability, energy efficiency, and environmental performance. These roofs can last for 40 to 70 years and are recyclable at the end of their useful life. Due to their durability and energy efficiency, they have significant cost-saving potential. Are they better for the environment?

A quality roof is one of the best ways to protect your home from the elements. It serves as a barrier against rain, snow, hail, wind, branches, and debris. Even just a small leak can cause significant problems in the home, and an inefficient roof can create energy performance issues throughout the home.

## Why Do Metal Roofs Save Energy?

As the demand for energy-saving building materials increases, metal roofs are installed more often. A study funded by the U.S. Department of Energy and conducted by the Oak Ridge National Laboratory shows why **metal roofs promote energy conservation** in the home. The answer has to do partially with how the roof is installed.

In the study, the metal roofing was attached with a batten/counter-batten system that allows airflow underneath. Researchers found a 45 percent decrease in the flow of heat with the metal roof, mostly attributable to the ventilation above the sheathing. Researchers also found up to 25 percent reduction in cooling costs.

When the roof is nailed directly to the roof deck, there is no air space below. This causes greater heat loss from the attic in the winter. Having an air gap acts almost like insulation, preventing heat transfer out of the home. Likewise, in the summer, an air gap prevents the heat of the sun from warming up the attic and the rest of the home.

Metal roofs can have solar reflective coatings applied, which reflect the sun's radiation and are helpful in warmer climates. In contrast, asphalt shingles store and retain more heat in the summer.

## Metal vs. Shingle Roofs

Roof longevity is another important consideration. Shingle roofs are said to last about 20 years, but this varies based on climate. Metal roofs can easily last twice or even three times as long. They are also better equipped for [solar panels](#). It is common to have to remove the solar panels when replacing a roof, thus a longer-lasting metal roof helps avoid this issue. In fact, a metal roof can easily outlive the solar panels.

The upfront cost of an asphalt roof is significantly lower but it lasts significantly less time. Shingle roofs are also somewhat easier to install, requiring less skill. However, when considering the long-term costs, metal roofs have a lower life cycle cost.

Metal roofs also contain cleaner materials, which makes them a better choice for catching rainwater. These roofs are 100 percent recyclable at the end of life and steel roofs contain at least 25 percent recycled content. Asphalt shingles, on the other hand, are known to contain [arsenic and polycyclic aromatic hydrocarbons \(PAHs\)](#) at levels that are harmful to human health and the environment. Although some recyclers break up asphalt shingles into small pieces [for use in road construction](#), it can cause contamination in loose form.

Aside from a higher upfront cost, metal roofs beat asphalt shingle roofs hands down on energy efficiency and environmental performance. They have more than [tripled in popularity](#) in recent years due to their many advantages.

*Do you have a metal roof on your home? Share your experience with the community in the [Earthling Forum](#).*