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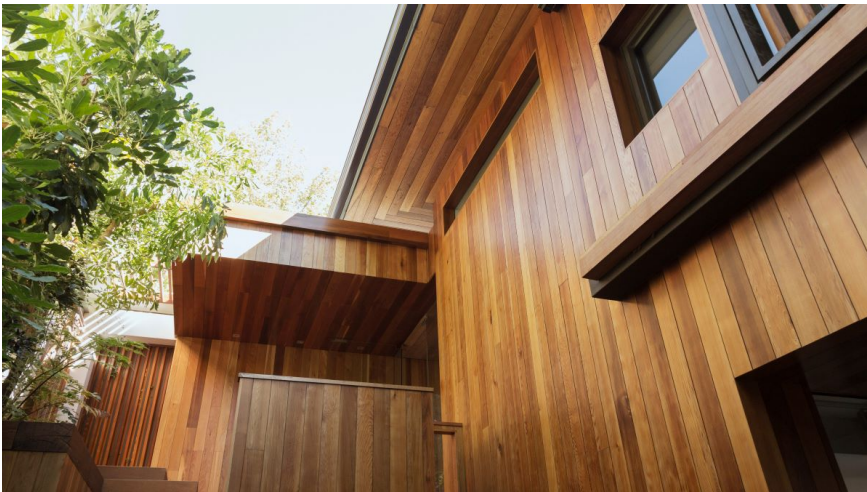
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A Buyer's Guide to Home Siding



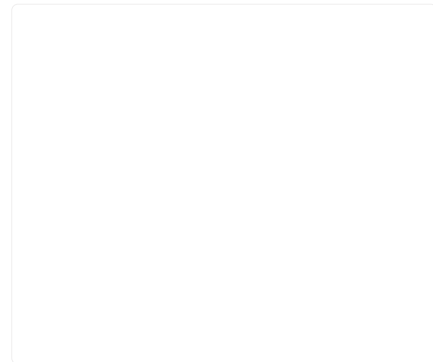
By [Gemma Alexander](#)

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Puzzling over the best siding option for your home? The most environmentally friendly option may be a home without siding. Sustainable building techniques like [earth-sheltered homes](#) or structural materials like adobe and rammed earth eliminate the need for cladding. However, if you already own a wood-framed house, you will have to choose a cladding material. And the most environmentally friendly choice for your specific home will depend on a number of factors.

The majority of [life cycle analyses](#) (LCA) for siding products have been performed by manufacturers and unsurprisingly



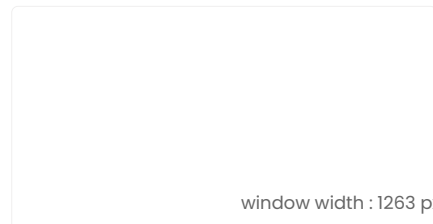
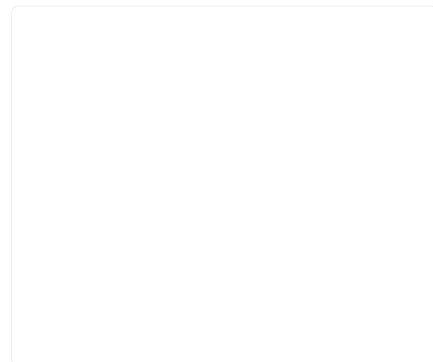
What Do You Think?



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- Yes
- No

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favor their own products. But a [life cycle analysis conducted at Kent State University](#) looked at six common siding materials for both climate change impacts and overall environmental impacts including effects on air and water quality. Let's look at those materials, plus one more we added to the list.

Materials

Wood

Wood is the most variable type of siding. The cost, aesthetics, and environmental impact depend on many factors. These include tree species, harvesting method, treatments, installation, and maintenance. [T1-11](#) is a type of plywood made to look like natural wood. Because it is more processed, it has a higher carbon footprint than natural wood boards and may contain toxic preservatives, [resins, and binders](#). When selecting solid wood siding, [redwood](#) and cedar are the preferred species. In the Kent State LCA, cedar had the lowest carbon footprint as well as the lowest overall environmental impacts. For the most sustainable wood siding, consider reclaimed lumber if you have the option. Avoid old-growth lumber and tropical species in favor of FSC-certified species grown in your region. And consider your [treatment](#) choices carefully.

Vinyl

Vinyl siding may even outstrip wood for popularity. It is inexpensive, lightweight, and easy to install. Some vinyl siding comes with insulation attached, which improves a home's energy efficiency. Vinyl is often promoted as an environmental choice. It did place second for sustainability in the Kent State LCA. However, vinyl siding is made from [polyvinyl chloride](#), or PVC, which is on [the red list](#) of building materials to avoid. Although [safe for homeowners](#), PVC production releases dioxins into the air and water, creating health hazards to workers and nearby residents. Although PVC is technically recyclable, PVC is the [least recycled plastic](#), and frequently ends up in incinerators, despite the fact that burning it releases vinyl chloride. Vinyl siding is best avoided if you can afford any other choice.



[Westlake Home - Luxury Organic Bedding](#)



Both vinyl and metal siding have their pros and cons. But if your metal siding isn't coated with vinyl, it has the added benefit of being recyclable at its end of life.

Metal

Although metal siding may evoke images of tin shacks to older generations, metal has become a popular siding material in recent years. Metal siding may be made from steel or aluminum, both of which are 100% recyclable and include recycled content as a matter of course. An oft-repeated, uncited statistic claims that siding for a 2,000-square-foot house uses the equivalent of six scrapped cars. The Kent State LCA did not consider steel, but placed aluminum roughly in the middle, with raw materials extraction and manufacturing energy the primary contributors to its environmental impact. Older metal siding options were prone to fading and discoloration, which has led to some newer types that are coated in vinyl. While this may improve colorfastness, it makes the siding unrecyclable.

Fiber Cement

Fiber cement is a relatively new option in home siding, but it is already one of the most common choices. Less expensive than but resembling natural wood, fiber cement provides a level of fire resistance without the use of asbestos that is valued in areas subject to [wildfires](#). In the Kent State LCA, fiber cement had the second-highest environmental impact of the six materials studied. It also does not have much potential for recycling at the end of its life.

Brick

Bricks have a high potential for recycling at the end of their life as siding, and old bricks are frequently reused rather than recycled (which uses less energy). [Brick is also made](#) from a natural material – clay – but that material is nonrenewable. In the Kent State LCA, brick had the highest environmental impact and created the most emissions of the six materials studied. The energy-intensive manufacturing process appears to be the primary reason for its low environmental score. Bricks are heavy, so transportation impacts are also high, even though most brick is used within 500 miles of manufacture.

Stucco

Because stucco does not perform as well in humid climates, it is most popular in the West and Southwest of the country. Stucco is used on [about a quarter](#) of new homes. Falling in the middle of the pack in the Kent State LCA, stucco is often applied over foam insulation, creating a weather-proof seal that can

dramatically reduce your indoor energy use. But foam insulation often contains **red list** materials like **halogenated flame retardants** and can negatively impact **indoor air quality**. While most stuccos are made with **Portland cement**, there are eco-stuccos options that use a mixture of sand, lime, straw, and bentonite.

Stone

Stone is a nonrenewable resource extracted from energy-intensive quarries that also destroy habitat. Because it is heavy, emissions from transportation are also very high. However, stone is fire-resistant and will outlast the house it encases. For a beautiful and eco-friendly option, try to source recycled stone from nearby or see if sufficient stone can be found on the building site. Stone is also very expensive, which may account for its use as siding on **only 1%** of new homes in the U.S.



Stone is fire-resistant and will outlast the house it encases. But try to source recycled stone from nearby to minimize your siding's environmental impacts.

Comparison Criteria

With only one independent life cycle analysis comparing multiple cladding materials, it is hard to definitively rank the choices. Relative impacts are even more muddled when the choices within each material category are considered. When there is no clear winner for every situation, homeowners must weigh the trade-offs against their own personal environmental priorities and practical considerations such as budget and product availability. Any of these materials may be the right choice under certain circumstances. Whichever material type you choose, make sure **your contractor** understands that you care about environmental impacts. Press for details about the specific products they use; within nearly every siding type some options are more sustainable than others.

Recycled Content

Look for a product made with recycled content. Although they can be expensive and hard to find, salvaged or reclaimed

wood, **brick**, and stone make beautiful home siding. New brick can also include pre-consumer **recycled materials** such as overburden from mining, washings from aggregate processing, grog, sawdust, and metallic oxides.

Engineered wood products like **Eco-Side** recycle pre-consumer FSC-certified hardwoods manufactured in a low-waste manufacturing facility. Fiber cement is **made with recycled materials** including cellulose fibers, sand, and cement. Some brands of stucco, like **Merlex**, use post-consumer recycled sand aggregate from crushed concrete.

Although metal **advocates claim**, "Metal roofing and siding panels are made with the highest recycled content from the most recyclable materials on earth," **one transparent company** admits the recycled content of steel is about 25%, while flat-rolled aluminum construction products include approximately 80–85% recycled content. Even vinyl siding can be made with recycled content; for example, some CertainTeed products claim **60% recycled content** with a mixture of pre- and post-consumer sources.



Made with recycled materials, fiber cement siding is more durable and fire-resistant – and less expensive – than wood. But like wood siding, it is not recyclable at end of life.

Production

According to the Kent State LCA, the manufacturing impacts of cedar and stucco siding are nearly negligible. Aluminum and vinyl also rated quite low, despite the known toxicity impacts of vinyl manufacturing in places like Louisiana's **Cancer Alley**. Fiber cement impacts were somewhat higher, probably as a result of the cement component. Impacts from the production of new brick exceed the total impacts of most other materials. That's because firing requires so much energy, which usually comes from burning fossil fuels. Companies that use sustainable energy to power their kilns like Denmark's **Randers Tegl** can reduce their environmental impact by half. Although quarrying natural stone – like mining metals – is inherently

destructive, [ANSI/NSC 373 Sustainable Production of Natural Dimension Stone](#) certification ensures that the stone was extracted and processed according to best practices.

Transportation

Where possible, minimize the distance your siding material must travel. This is especially true for heavier materials like brick and stone. In the Southeast U.S., locally grown cypress may be a better choice than red cedar grown in the Pacific Northwest. Because it is so lightweight, transportation impacts are lower for vinyl. Stucco must be applied wet, so it is usually mixed on site, but consider the source when selecting materials.

Recyclability

Although natural wood performs best on most measures of sustainability, it is not recyclable and can rarely be salvaged. Wood is biodegradable, but the coatings and preservatives that extend the life of wood siding are rarely harmless in decomposition. Many homeowners choose to cover stucco with a new material rather than remove it. Removal is difficult and requires a professional. Old stucco cannot be recycled. Fiber cement is also not recyclable. Both brick and stone can be salvaged and sold if properly disassembled rather than demolished. Metal is 100% recyclable. Surprisingly, [vinyl is also recyclable](#) although finding a recycler may be more challenging.

Energy Efficiency

By themselves, most cladding materials have very [low insulation value](#). Perhaps surprisingly, natural wood performs best with an R-value around 0.8. However, you can find siding products with an attached layer of foam insulation. Vinyl is the most common insulated siding choice, but insulated metal and fiber cement siding is also available. [Foam insulation](#) presents its own environmental drawbacks, but these may be outweighed by energy efficiency considerations, depending on the climate where you live.

Durability

The less often you need to replace the siding on your home, the lower its impact. For durability, stone is the clear winner as it can last for centuries. Brick can also outlast the house, with a lifespan of [more than 100 years](#) if properly installed and maintained. Stucco may require patching and repairs over time, but can be expected to [last 50–80 years](#), especially in a dry climate. Metal siding can be expected to last [more than 50 years](#), and often comes with a warranty of up to 45 years. However, some metal siding products come with a coating that will begin to fade much earlier.

Fiber cement as we know it today was popularized [in the](#)

1990s. It is warranted **for 30 years**, which means that there is not much history of siding replacement for this material yet. Vinyl siding, although requiring less maintenance than other materials, lasts **between 20–40 years**.

Although wood performs best on nearly every other measure, wood requires more maintenance than other types of home siding. This creates a lot more variability in its expected lifespan. Depending on climatic conditions and maintenance practices, wood can last as little as **20 years**, although cedar siding has been known to last for more than 70 years.

Comparison Chart

Click the image below for a larger version of the home siding comparison chart.

Earth911 Home Siding Comparison Chart

| Material | Recycled Content | Production Considerations | Recyclability | R-Value | Certifications | Lifespan |
|--------------|-------------------------------|----------------------------------|---------------|-----------|--|-------------|
| Wood | Salvage or engineered woods | Forestry practices | Salvage | 0.81-0.87 | FSC (third party) | 20-70 years |
| Vinyl | Yes for some brands | Dioxin production | Yes | 0.61 | Vantage Vinyl (industry) | 20-40 years |
| Stucco | Yes for some brands | Minor | No | 0.37-0.4 | None | 50-80 years |
| Metal | Yes, steel more than aluminum | Extraction and energy use | Yes | 0.61 | None | 50 years |
| Fiber Cement | Yes | Cement; manufacturing efficiency | No | 0.37 | None | 30+ years |
| Brick | Salvage; yes | Energy use and transportation | Salvage | 0.44 | Brick as an Environmentally Preferred Product Certification Program (industry recycled content verification) | 100+ years |
| Stone | Salvage | Extraction and transportation | Salvage | 0.44 | ANSI/NSC 373 | Centuries |



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[How To Cut Your Summer Energy Bills](#)



By [Gemma Alexander](#)

Gemma Alexander has an M.S. in urban horticulture and a backyard filled with native plants. After working in a genetics laboratory and at a landfill, she now writes about the environment, the arts and family. See more of her writing [here](#).

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