

FLIPPING GREEN

HOW TO MAKE YOUR NEW
CONSTRUCTION OR REHAB PROJECT

ECO-FRIENDLY



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INTRODUCTION

Americans are no longer living in the 1950s, when scientists, producers, and consumers alike were ignorant of the negative environmental impact of cheap, mass-produced goods like plastics, PVCs, and lead-based lighting. Now, we know about the dangers of building without considering the environmental impact of our materials. We are also aware of the many benefits of eco-friendly residential construction, including higher sale prices, positive publicity, and tax credits. For the

investor who makes green updates a priority, there can be huge ethical and financial rewards.

A Realtor.com survey showed that most homeowners take the environmental impact of their property into consideration, with over 30% of respondents saying they live in an eco-friendly home and almost 85% saying that they would like to in the future. The respondents who do not currently live in eco-friendly homes still take steps

to reduce their carbon footprint: 80% use energy-efficient appliances and 75% maintain energy-efficient lighting. Efficient appliances and lights are so widespread now that their long-term cost effectiveness is indisputable.

It is clear that energy efficient home features are desirable to homebuyers; 86% of respondents wanted efficient air conditioning, 85% wanted efficient appliances, and 79% wanted efficient lighting. The desire for environmentally conscious homes can translate to big bucks in a smart investor's pocket.

A California study showed that a house with a green certification label sells for 9% more than similar, non-green alternatives (Washington Post). Of course, this is just an average: if you are upgrading a home in an area where the residents support energy conservation, you are going to get better returns. To measure this, you can use the same tactic as the researchers: look at the percentage of hybrid-auto registrations in the area.

So how does an environmentally conscious investor score that coveted green certification label?

The two main labels for green homes are ENERGY STAR and LEED. The ENERGY STAR system is available for homes that reduce heating, cooling, and water usage costs as well as designs that improve indoor air quality. LEED certifications, on the other hand, focus more on projects that practice sustainable building. This paper will explore alternatives that will help you work toward earning each of these certifications so you can choose the renovations most suited to your purposes.

Green buildings reduce energy use by 30%-50%, reduce CO2 emissions by 35%, reduce waste output by 70%, and reduce water usage by 40%. Since they typically cost around 3%-5% more than conventional buildings and sell for 9% extra, building green in forward-thinking locales is an easy and profitable choice to make (Ableskills).

GREEN CONSTRUCTION MATERIALS

Whether you are building a new home or adding to an existing one, you can make sustainable and environmentally friendly construction choices without breaking the bank. There are lots of alternatives to conventional materials with different pros and cons to each. Here is a breakdown of some of your options.

Sheep's Wool

Material Cost: \$1.85 per sq. ft. (Fiberglass cost: \$0.30 per sq. ft.)

Sheep's wool is becoming a popular, eco-friendly alternative to traditional insulation materials like fiberglass or foam board. It is a direct replacement for other insulators and can be installed into a conventionally constructed home. It works by trapping air in tiny air pockets, which is why it keeps sheep warm in the winter and cool in the summer and why it will do the same for your home (HowStuffWorks).

Pros: Sheep's wool is a sustainable choice to insulate a home and is a strong insulator with an R value comparable to fiberglass - however, it retains its R value for around 50 years compared to 10 years for fiberglass. It is breathable, fire-resistant, and mold-resistant. It also traps pollutants like CO2 and is safe to handle without protective gear. Additionally, it absorbs water without feeling damp and generates heat to

prevent condensation (Eco Building Products).

Cons: It is more expensive than fiberglass and similar in price to high-end insulation types like spray foam. Additionally, it must be treated with boric acid or it may be damaged by moths.

Cotton

Material Cost: \$0.90 per sq. ft. (Fiberglass cost: \$0.30 per sq. ft.)

Since there are so many companies that produce cheaper textiles for clothing, there is a lot of recycled cotton available for house insulation. It has an R value just as high or higher than most fiberglass and wool.

Pros: Cheaper than wool, this material is still flame-retardant when treated with boron. It comes from a natural source and requires little energy to produce. Additionally, it is a deterrent to certain insects (Planning Tiny).

Cons: Cotton is a water heavy crop that most farmers use pesticides to grow.

Aerogel

Material Cost: \$2.00 per board ft. (Fiberglass cost: \$0.30 per sq. ft.)

Until recently, aerogel was so expensive that only NASA could afford it. Aerogels are produced by taking the liquid out of gels and are over 90% air. Because aerogels are so porous and lightweight, they are extremely powerful insulators, with an R value many times higher than fiberglass (Cnet).

Pros: Since they are so powerful, homeowners will reduce their energy use for heating and cooling drastically in a home insulated by aerogel. Additionally, since the product is 90% air, there are no extra chemicals or offgassing. It can also be used between transparent panels since it is translucent.

Cons: This is the most expensive insulation available. It is not produced as cleanly as wool or cotton, being derived from petrochemicals, and is known for being very dusty.

Straw Bale

Building Cost: \$110-\$170 per sq. ft. (Conventional: \$125 per sq. ft.)

Typically, building a straw bale home will cost about 10% more than a conventional construction project (StrawBale.com). Even though the material itself is very cheap, the labor required for a straw bale home is extensive: you need to stack, shape, prep, and plaster the walls. If your project is small and you plan on doing the work yourself, using straw bales will actually save you money. One group was able to build a straw bale home for only \$32 per square foot since they did most of the work themselves and gravitated toward recycled materials (Solar Haven). The work is simple but labor intensive, so if you are doing it yourself be prepared to expend a lot of effort and if you are hiring a contractor make sure they are experienced and excited about building environmentally friendly homes.

Pros: Straw bale is also an incredible insulator and will save future homeowners on heating and cooling costs. Because it is packed so tightly, it is also fire resistant. In addition, the material is an agricultural by-product and an annually-renewable resource. It allows for construction without an enormous carbon-footprint (Paja Construction).

Cons: There are some areas of the country that do not allow straw bale construction, so check and see if it's an acceptable practice in your location prior to deciding on this method. In addition, if the construction is not properly done, straw bales are more susceptible to insect infestations and mold than typical materials (another reason to go with an experienced

Rammed Earth

Building Cost: \$110-\$160 per sq. ft. (Conventional: \$125 per sq. ft.)

Rammed earth is a mixture of dirt, gravel, sand, silt, and clay that is poured between flat panels, then compressed. It is strong enough to stand alone as a loadbearing construction, but can also be fortified with reinforcements, similar to concrete (YourHome). Although this is a new

technique for modern building, it has been used since ancient times.

Pros: Although it is not an insulator, rammed earth has a lot of thermal mass which will slow the transfer of heat. In addition, it is durable, breathable, and moisture-, vermin-, and fire-resistant. Rammed earth is also a natural product and its manufacturing has little negative

environmental impact.

Cons: Installing rammed earth walls is labor-intensive and the shape is limited: you cannot build rounded walls or have much structural variation. Additionally, colder climates require additional insulation which reduces the breathability of the structure (Alternative Housing).

EXTERIOR ALTERNATIVES

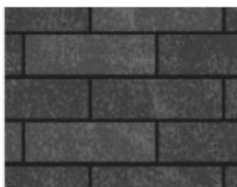
Roof

Instead of a traditional roof, eco-friendly investors can install a cool roof, which will reflect energy from the sun and reduce cooling costs. One way to achieve this is by installing solar reflective shingles, which will add about \$1 per square foot to installation costs (Energy.gov). Alternatively, investors can install a metal roof to achieve similar results.

Here is a summary of common roof pricings from Angie's List:

EVALUATE PRICING

The type of roof on your home greatly influences repair costs. Roofs can be flat or sloped, high or low pitch and metal or shingled. Material costs vary greatly between roof types, and some require more labor and materials than others. While asphalt shingles may last 20 years or more, tile, metal, and slate may last 50 or more years, which can play a role in determining the type you want.



ASPHALT

\$1.2-\$4

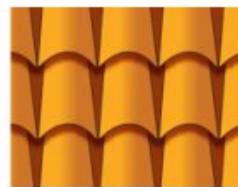
per sq. ft.



SLATE

\$8-\$40

per sq. ft.



TILE

\$6-\$40*

per sq. ft.



METAL

\$5-\$18**

per sq. ft.

* Installed

** Higher price for custom-made premium tiles and on installed pattern

If you don't want to take on the burden of installing a new roof on a home, you can simply paint the existing roof with reflective paint for around \$0.75 per square foot (Poplar).

Another option is to put solar panels on angled roofs. You can use resources like the Solar Electricity Handbook to determine the optimally efficient angle in your location. However, unless you are building in an extremely wealthy and environmentally conscious region, this may not be the best investment for a rehab or new construction project. Instead, build new roofs at the optimal angle and inform potential buyers that they can install solar panels with maximum efficiency.

Driveway

A simple, eco-friendly alternative to a traditional asphalt driveway is to install grasscrete, a concrete-grass paving system that can range from \$3-\$10 per square foot (Improvenet). If you already need to replace or add a driveway, this is an easy and affordable alternative to asphalt, which normally costs around \$4/sq ft.

To install this green driveway, lay down a base of large crushed stones on top of the existing soil, add a bedding of crushed gravel or brick on top, place the open-center pavers, then fill them with soil or turf. You can opt for materials other than concrete, like stone or recycled plastic, but concrete is typically regarded as the best combination of affordability and visual appeal.

Deck or Patio

If you feel that a deck is necessary for your real estate project, you are going to have to choose between the lesser of two evils.

While wood decks are a natural, healthy, and biodegradable option, it is difficult to tell if the

wood was harvested using sustainable methods - and if it was, it is likely expensive. Additionally, natural decks are high maintenance and the stains and seals required to make them durable are toxic to the environment.

Composite decks, on the other hand, are often manufactured using recycled materials and are very durable and low maintenance - they can be cleaned with only soap and water. There are different options available, but they are all a combination of organic and synthetic materials. As a result, they are neither compostable nor recyclable, meaning that when they do eventually need to be replaced there is no green way to dispose of them (Treehugger).

If possible, consider installing a patio instead. You can choose from a wide variety of eco-friendly pavers made from stone, bamboo, or cork. You can even choose concrete and apply a non-toxic soy stain to make it more visually appealing. This way, you avoid the deck dilemma and create a natural space that works with its surroundings.

INDOOR ECO UPDATES

Appliances

The first step you should take in any environmentally friendly home is replacing old and clunky appliances with ENERGY STAR rated models. Although they are more expensive than other, less efficient models, they are obvious long-term money savers for smart homebuyers. Most homeowners already have some of these appliances and potential buyers will expect them. The question isn't should you choose ENERGY STAR appliances, but which ENERGY STAR appliances should you choose? Once again, base your decisions on the income level and environmental mindset of the area.

Flooring

There are lots of different options for flooring with varying costs and environmental impacts.

Three environmentally friendly options include bamboo or cork for between \$4-\$12 per sq. ft. and repurposed hardwood for \$3-\$8 per sq. ft.

For tiles, choose linoleum instead of vinyl. Vinyl is produced with a number of carcinogens, chemicals, and other toxins and is one of the worst floorings to choose, from an environmental impact perspective.

Common Flooring Prices (per square foot)*:

Hardwood: \$3-\$8
DIY: Difficult

Cork & Bamboo: \$4-\$12
DIY: Medium

Laminate: \$1-\$6
DIY: Easy

Carpet: \$2-\$26
DIY: Medium

Vinyl: \$1-\$8
DIY: Easy

Tile: \$4-\$8
DIY: Medium

*Data from Zillow

Building a Green Kitchen

There are three key green alternatives to standard countertop materials: paper-based, bamboo, and recycled glass.

Paper-Based

Cost: starting at \$30 per sq. ft.

These are a simple, cheap, and low maintenance choice. However, the color choices are limited, as paper-based countertops are only available in dark, matte hues. In addition, while surface scratches can be fixed, discoloration is almost guaranteed with long-term use (Remodelista).

Bamboo

Cost: starting at \$40 per sq. ft.

Although these countertops are durable and extremely environmentally friendly, they are high-maintenance and easily stained. However, there are a lot more color, finish, and grain options than there are for paper-based countertops (ImproveNet).

Recycled Glass

Cost: starting at \$50 per sq. ft.

This is the high-end eco-friendly option with a price similar to slab granite. It is beautiful and very tough, so it will last a long time without discoloration or staining (ImproveNet). There is an incredibly wide selection of styles to choose from, from countertops replicating granite to brightly colored or translucent options.

Building a Green Bathroom

The most important environmental factor to consider with bathrooms is water waste. To temper water usage (and save money on water bills), investors can install low-flow toilets, showerheads, and faucets.

Choose tiles made of recycled content for the floor and put in lots of carefully-placed windows to naturally improve ventilation and add light (Treehugger).

HEATING, COOLING, & LIGHTING

Here, investors really have an opportunity to create an energy-efficient and environmentally friendly house. There are lots of easy and inexpensive upgrades that will allow you to advertise your project as a green home.

One slightly unconventional air conditioning alternative is a whole-house fan in the attic. It costs around \$150-\$550, although keep in mind that the installation costs will tack on an additional \$1,000. In addition, you may need to add additional roof vents to the attic so it can handle the large volume of airflow.

It works by pulling in cool air at night and circulating it throughout the house during the day.

Even in hot weather, it can serve as a replacement for air conditioning and keep families comfortable, and it only uses 10% of the energy of an air conditioner. One downside is that it can be noisy: take steps to mitigate this issue by installing rubber or felt gaskets (Energy.gov).

However, buyers may be wary of a house without air conditioning, especially in warmer climates. You can supplement the whole-house fan with a low-powered central unit, starting at \$500, or with smaller units in key areas such as bedrooms.

If the whole house fan is not right for your project, you can choose an ENERGY STAR HVAC system to cut cooling costs by as much as 30%.

As far as lighting is concerned, you should install LED bulbs instead of fluorescent or incandescent lights. Not only are they longer-lasting and more energy efficient, but they are cheaper in the long run as well.

Outdoors, you can install solar-powered garden lights that will charge during the day and turn on at night. These are so popular nowadays that you can choose from a wide variety of styles without increasing your budget at all.

LONG-TERM BULB COSTS (THE SIMPLE DOLLAR)

	Incandescent	CFL	LED
Approximate cost per bulb	\$1	\$2	\$8
Average lifespan	1,200 hours	8,00 hours	25,000 hours
Watts used	60W	14W	10W
No. of bulbs needed for 25,000 hours of use	21	3	1
Total purchase price of bulbs over 23 years	\$21	\$6	\$8
Total cost of electricity used (25,000 hours at \$0.12 per kWh)	\$180	\$42	\$30
Total operational cost over 23 years	\$201	\$48	\$38

OBTAINING A GREEN BUILDING CERTIFICATION

ENERGY STAR

If your goal is to build an energy efficient home (and help the future homeowners keep their utility bills low), then you are going to want to apply for the ENERGY STAR label. To gain the ENERGY STAR certification, you need to meet certain minimum efficiency requirements. Here is a general outline of the standards.

MANDATORY REQUIREMENTS (FROM ENERGY STAR VERSION 3)

Party Responsible	Requirements
Rater	Completion of Rater Design Review Checklist Completion of Rater Field Checklist
HVAC System Designer	Completion of HVAC Design Report
HVAC Installign Contractor	Completion of HVAC Comissioning Checklist
Builder	Completion of Water Management System Builder Requirements

REFERENCE DESIGN HOME (FROM ENERGY STAR VERSION 3)

Party Responsible	Hot Climates	Mixed and Cold Climates
Cooling Equipment	-14.5 SEER / 12 EER AC, heat pump	-13 SEER AC, heat pump
Heating Equipment	-80 AFUE gas/oil furnace or boiler -8.2 HSPF / 14.5 SEER / 12 EER air-source heat pump (with electric or dual-fuel backup)	-90 AFUE gas furnace, 85 AFUE ENERGY STAR oil furnace or boiler -Heat pump with minimum 8.5 HSPF, 14.5 SEER, 12 EER (depending on CZ)
Envelope, Windows, and Doors	-Radiant barrier modeled if more than 10 linear feet of ductwork inside unconditioned attic -Insulation modeled to 2009 IECC levels and Grade I installation -Infiltration rates depend on CZ -Window and door U-Value and SHGC depend on CZ	-No radiant barrier modeled -Insulation modeled to 2009 IECC levels and Grade I installation -Infiltration rates depend on CZ -Window and door U-Value and SHGC depend on CZ
Water Heater	-DHW equipment modeled with efficiency levels according to volume	-DHW equipment modeled with efficiency levels according to volume
Thermostat and Ductwork	-Programmable thermostat modeled -Supply ducts in unconditioned attics with R-8 insulation, all other ducts in unconditioned space with R-6 -Duct leakage modeled at at least 4 CFM25 per 100 sq. ft. of conditioned floor area or greater than 40 CFM25	-Programmable thermostat modeled -Supply ducts in unconditioned attics with R-8 insulation, all other ducts in unconditioned space with R-6 -Duct leakage modeled at at least 4 CFM25 per 100 sq. ft. of conditioned floor area or greater than 40 CFM25
Lighting and Appliances	-ENERGY STAR refrigerators, dishwashers, and ceiling fans -ENERGY STAR light bulbs in 80% of RESNET Qualifying Light Fixture Locations	-ENERGY STAR refrigerators, dishwashers, and ceiling fans -ENERGY STAR light bulbs in 80% of RESNET Qualifying Light Fixture Locations

BENCHMARK HOME (FROM ENERGY STAR VERSION 3)

Bedrooms to be Built	0	1	2	3	4	5	6	7	8
Conditioned Floor Area (sq. ft.)	1,000	1,000	1,600	2,200	2,800	3,400	4,000	4,600	5,200

LEED

If you are focusing on building with environmentally conscious practices and sustainable materials, then you want to make sure you earn a LEED label. Unlike the ENERGY STAR program, the LEED system works by awarding points for different sustainable building factors.

To be LEED certified, your house needs to earn at least 40 points, but the more points you earn the higher the reward. Here is a table showing the requirements for each level of LEED:

Level	Certified	Silver	Gold	Platinum
Points	40-49	50-59	60-79	80+

Here are the minimum program requirements for LEED (From USGBC.org):

1. Must be in a permanent location on existing land.
2. Must use reasonable LEED boundaries.
3. Must comply with project size requirements.

Find out more about qualifying for an ENERGY STAR certification here:

https://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.homes_guidelns

Find out more about qualifying for a LEED certification here:

<https://www.usgbc.org/articles/good-know-minimum-program-requirements-leed>

CREDITS AND PREREQUISITS (FROM USGBC.ORG)

CREDIT/ PREREQUISITE	POINTS AVAILABLE		
INTEGRATIVE PROCESS (C)	2	Total Water Use (C)	12
LOCATION AND TRANSPORTATION:		Indoor Water Use (C)	6
Floodplain Avoidance (P)	Required	Outdoor Water Use (C)	4
LEED for Neighborhood		ENERGY AND ATMOSPHERE:	
Development (C)	15	Minimum Energy Performance,	
Site Selection (C)	8	Energy Metering, Education of the	
Compact Development (C)	3	Homeowner, Tenant, or Building	
Community Resources (C)	2	Manager, Home Size (P)	Required
Access to Transit (C)	2	Annual Energy Use (C)	29
SUSTAINABLE SITES:		Efficient Hot Water Distribution	
Construction Activity Pollution		System (C)	5
Prevention, No Invasive Plants (P)	Required	Advanced Utility Tracking (C)	2
Heat Island Reduction (C)	2	Active Solar-Ready Design (C)	1
Rainwater Management (C)	3	HVAC Start-Up Credentialing (C)	1
Non-Toxic Pest Control (C)	2	Building Orientation for Passive Solar	
WATER EFFICIENCY:		(C)	3
Water Metering (P)	Required	Air Infiltration (C)	2
		Envelope Insulation (C)	2
		Windows (C)	3
		Space Heating and Cooling	

Equipment (C)	4	INDOOR ENVIRONMENTAL QUALITY:	
Heating and Cooling Distribution Systems (C)	3	Ventilation, Combustion Venting, Garage Pollutant Protection, Radon-Resistant Construction, Air Filtering,	
Efficient Domestic Hot Water Equipment (C)	3	Environmental Tobacco Smoke,	
Lighting (C)	2	Compartmentalization (P)	Required
High-Efficiency Appliances (C)	2	Enhanced Ventilation (C)	3
Renewable Energy (C)	4	Contaminant Control (C)	2
MATERIALS AND RESOURCES:		Balancing of Heating and Cooling Distribution Systems (C)	3
Certified Tropical Wood, Durability Management (P)	Required	Enhanced Compartmentalization (C)	1
Durability Management Verification (C)	1	Enhanced Garage Pollutant Protection (C)	2
Environmentally Preferable Products (C)	4	Low-Emitting Products (C)	3
Construction Waste Management (C)	3	INNOVATION:	
Material-Efficient Framing (C)	2	Preliminary Rating (P)	Required
		Innovation (C)	5
		LEED AP for Homes (C)	1
		REGIONAL PRIORITY (C)	4

SELLING YOUR GREEN HOME

According to USGBC.org, by 2018, 84% of all residential construction will include sustainable features and green single-family housing will represent 40% of the market. In addition, the residential green construction market is expected to grow by 24.5% a year. For investors who are ahead of the curve, this growth can translate to major profits and fast-moving houses.

To convince homebuyers that your completed home is worth the extra money, remind them that the house provides:

1. Sustainability

Appeal to the potential buyer's ethics by informing them that the house was built with a minimal

footprint and that the efficient design will help them lessen their environmental impact.

2. Financial Savings

The many energy- and water-saving features you incorporate will translate to major savings on utility bills for the owners. Make sure you take the time to calculate exactly how much consumers can save by looking at the ratings of all of your appliances and researching the average savings of the other features you included. That way, you can convince buyers of the financial benefits with hard data.

3. Healthy Living

Since you used healthy materials without toxic

chemicals, your home will have great indoor air quality and will allow the homeowners to live cleanly. Plus, there is evidence that green building materials can actually reduce the severity of asthma symptoms and allergies.

4. High Resale Value

If an eco-friendly house is a financial benefit for you and the potential buyers, then it will be a plus when they eventually sell. The world is moving

toward green living and sustainability, so the profit in selling a green home will only increase with time.

By pointing out the many benefits of green living to homebuyers, you will make the most out of all of the work and money you put into your environmentally friendly fix and flip or new construction project (BoomTown).

CONCLUSION

There are some general guidelines that you can follow to build a better home, such as choosing paints without volatile organic compounds, or VOCs. In addition, add windows and skylight to reduce the need for electric light and open up the space. Whenever possible, choose recycled materials for your construction and buy from companies that harvest or manufacture sustainable goods.

Working toward environmentally conscious real estate investments has numerous ethical and financial benefits that a smart investor can enjoy by implementing the eco-friendly upgrades suggested here. However, remember that you are an investor first and a good samaritan second, so don't overspend trying to build an ultra-efficient home unless you are certain it will pay off.

The most important aspect of an environmentally-friendly real estate investment project is that you choose the best options available within your price range every step of the way. Going in, select an architect and contractor that are known for their green values and past environmentally-friendly work. They will be able to help you design an energy-efficient home and build it sustainably. Follow ENERGY STAR and LEED guidelines and you will end up with a home that any educated and environmentally-conscious individual will be proud to call their own.

Asset Based Lending, LLC.



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