JUNE 1

Whittier-Mapleton Garden Tour

Now in its 17th year, this self-guided tour of stunning Boulder gardens is Whittier International Elementary School's largest annual fundraiser, and also features garden demos and food trucks. Visit www.whittiergardentour.com for details.

PHOTO BY KRISTEN PALMER

JUNE 1

Mapleton Hill Rummage Sale

Held annually on the same day as the Whittier-Mapleton Garden Tour, this enormous rummage sale lets you hunt for treasures at dozens of yard sales in the historic Mapleton Hill neighborhood. The sale normally runs 8 a.m.-2 p.m. (no early birds, please), but check the group's Facebook page for possible time changes.

JUNE 7-8

Festival of Flowers Garden Tour

Gather inspiration for your yard as you tour a number of beautiful, private Longmont gardens. Homeowners are on hand to answer questions during this annual tour that benefits the Longmont Symphony Guild. Hours are 9 a.m.-3 p.m. both days. Visit www.longmontsymphony.org/our-guild.

JUNE 21-23

Colorado Tiny House Festival

This third annual event showcases every kind of tiny home, from small buildings and container homes to yurts, school-bus conversions and renovated RVs. The event includes educational resources, food and drink options, live entertainment and more. Kids under 12 are free. Camping is available and pets are welcome. At 9755 Henderson Road in Brighton. Visit www.tinyhousedates.com.

PHOTO COURTESY COLORADO TINY HOUSE FESTIVAL

WHO TO KNOW

Left to right: Scott Rodwin, Bill Holicky, Melissa Morgan, Rick Sommerfeld and David Sloan.

And the Winner Is ...

At its annual January meeting, the Colorado Green Building Guild (CGBG) presented three awards to honor accomplishments in green building.

BOULDER COMMONS, a net-zero-energy development near Pearl Parkway and 30th Street in Boulder, was named **Green Building of the Year**. Completed in September 2017, the project consists of two commercial buildings with 100,000 square feet of professional space, a restaurant, coffee shop and flexible space, and it's accessible by Boulder's trail system and public transportation network.

BILL HOLICKY, a principal at Coburn Development, received the **Leadership Award** for his work on the project, and his LEED projects and committee service.

RICK SOMMERFELD, a design-build professor at the University of Colorado who has been involved in sustainable green building since the industry's inception, was named **Green Champion**. He adds his newest award to a long list of others he's received.

Submit nominations for the 2019 awards, to be presented in January 2020, online at www.cgbg.org.

PHOTO COURTESY CGBG

GREAT GREEN IDEAS

Here are an architect's top 10 recommendations for building a cozy new home that's super energy-efficient.

BY **SCOTT RODWIN**

1 Be Lizard-Like

Passive solar is the least-expensive way to reduce energy bills and make your home comfortable. This type of design harvests the sun when it's cold and blocks it when it's warm, much like our cold-blooded reptilian friends. To best accomplish this, passive solar places the majority of windows on the south side, where it's easiest and most important to control when and how sunlight enters the house.

Passive solar design avoids using skylights, reduces windows on the east, west and north, and protects large areas of glass on the west side with a deep overhang to minimize hot summer sun while still allowing for mountain views. Low-E window films can limit or welcome solar gain, depending on their orientation.

The big, heavy stuff inside a home, like stone, water, concrete, tile and earth, is known as thermal mass. This mass absorbs solar radiation, so the more of it you have, the longer it takes the home to heat up and cool down, helping the house to comfortably coast through cold nights and warm days.

2 Build with Bales

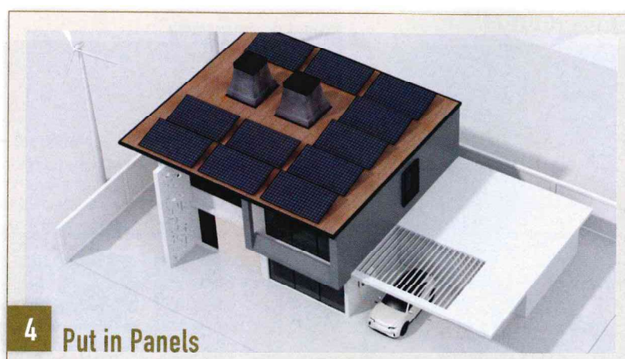
Straw-bale construction has been around for 130 years in Colorado, and it's still one of the greenest, lowest-carbon building methods. Building with straw bales results in fat, wobbly walls with R-50 insulation value, great fire resistance and high thermal mass. A straw-bale house actually costs the same or more to build than a conventional house, because it requires the subcontractors to perform custom work. But if you like getting your hands dirty, you can have fun constructing your own super energy-efficient straw-bale walls. ►

PHOTOS: LIVING ROOM COURTESY RODWIN ARCHITECTURE+SKYCASTLE CONSTRUCTION; WINDOW AND STRAW BALES BY SHUTTERSTOCK.COM

3 Be Conventionally Awesome

Conventional furnaces, boilers and evaporative coolers have improved dramatically in the last decade. Newer sealed-combustion furnaces can be 96-percent efficient; boilers can be 98 percent. However, even the most efficient air conditioner (SEER 21) is still one of a home's biggest energy hogs. Fortunately, a simple old-fashioned evaporative cooler—aka a "swamp cooler"—is less expensive and about 70 percent more energy efficient than standard air conditioning.

Evaporative coolers have a downside: They can't be ducted around the house, so they just dump cool air into one central section. To move cool air around, you'll have to open doors and windows to pull air into that area.



4 Put in Panels

Solar panels get more efficient every year and their overall cost is subsidized nearly 50 percent through rebates and tax credits. But if you're holding out for Tesla's solar shingles, which the company claims will cost no more than a conventional roof shingle, don't hold your breath. The shingles likely won't be available for a couple more years and they'll cost a lot more.

In the Xcel Energy utility area, homes are limited to installing an array that provides up to 120 percent of its electrical use. So consider sizing a solar system to include electric-vehicle charging and install 240v outlets in the garage to accommodate future charging needs. According to the Colorado Energy Office, our state could have close to 1 million electric vehicles on the road by 2030.

5 Wear a Puffy Coat

It's hard to have too much insulation, although the return on investment decreases as you reach the upper limits. Spray-foam insulation provides the best R-value (thermal resistance per inch) and air sealing, but it's also the most expensive. Blow either closed-celled or open-celled foam into wall cavities and adhere it to roof sheathing, floor framing and crawl-space walls. Closed-celled foam insulates better than open-celled foam, but it's more expensive.

Cellulose is a good cost-effective insulation made from recycled newspapers that effectively fills in nooks and crannies. Blown-in-blanket fiberglass is about the same in cost and effectiveness, while fiberglass batt insulation is the cheapest and least-effective option. Wrapping a 1-inch XPS rigid insulation board (blueboard) around the entire house also prevents energy loss through a home's walls.

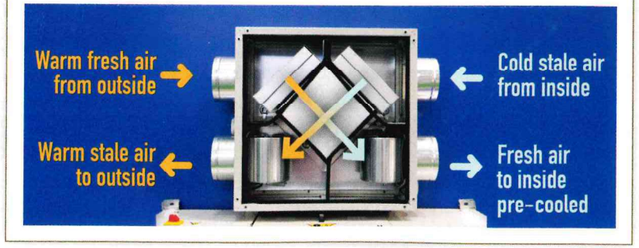
Recommended insulation amounts are R-50 to R-60 for ceilings; R-21 to R-30 for walls, soffits and rim joists; and R-10 for the under-floor slab.

6 Battery Up

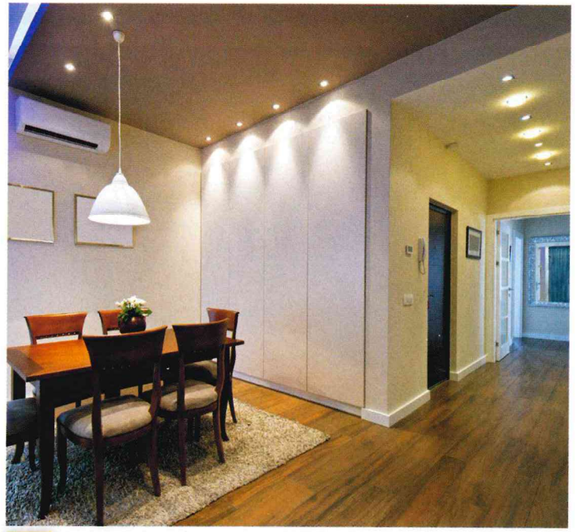
Batteries that store excess energy from solar panels for use at night or during outages have been around a while, but they've evolved dramatically in recent years. Deep-cycle lead-acid batteries were the standard for decades, until Tesla unveiled its lithium-ion Powerwall in 2015. The company came out with a new version in 2016 that doubles the storage, but with an installed price tag of around $10,000. Tesla isn't the only option. LG Electronics offers a system at a lower price point that couples with the company's solar systems. Most homeowners combine a battery-storage system with an electric utility grid-tied system, as batteries can't power a whole house for more than an hour or two.

7 Breathe Easy

Energy recovery ventilators (ERVs) are thermal-transfer magic boxes. When you tightly seal a home, toxins have a greater propensity to build up indoors, so it's important to introduce a lot of fresh air. But that could ruin your energy efficiency, which is where the ERV comes in. It exchanges the ambient temperature of the indoor air with air coming in from outdoors, saving 70 percent of a home's hot or cool air from being exhausted. ►



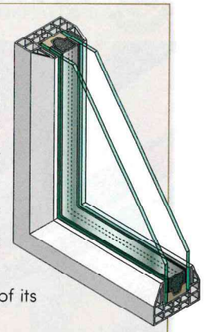
PHOTOS: PUFFY COAT BY SCOTT RODWIN; SOLAR PANELS AND ERV BY SHUTTERSTOCK.COM



8 Be LED

The price of LED lights has plummeted in the last decade, while the quality of their light continues to improve. The color spectrum is now very close to incandescent bulbs (2700 Kelvin), but LEDs last 10 times longer and use 90 percent less energy.

9 Take It "E"-zy

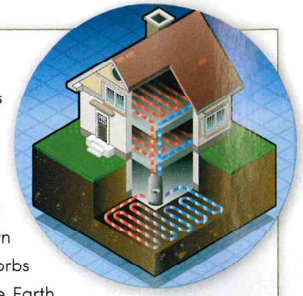


If you have inefficient windows, it's like walking around on a freezing day in a thick down jacket (your walls and roof), but with the zipper open (your windows). Windows are generally the weakest spot in a home's energy envelope, yet they typically comprise 10 to 25 percent of its surface area.

Double-paned, low-E, Energy-Star-rated windows with a U-value (heat-transfer rating) of 0.3 or lower are the norm for new homes in Boulder County. But if you want a Net-Zero home or you're building at higher elevations, consider argon-gas-filled, triple-paned windows with a double low-E coating that stays warm to the touch, even when it's zero degrees outside. (Check out locally made Alpen windows at www.thinkalpen.com.) Additionally, consider using low-E films to fine-tune the windows' solar heat gain coefficient that determines how much ultraviolet energy each window admits.

PHOTO AND ILLUSTRATIONS BY SHUTTERSTOCK.COM

10 Tap the Earth



Ground source heat pumps are a miracle of mechanical engineering. They leverage the planet's natural 55°F temperature by pumping liquid in sealed tubes down deep wells, where it absorbs and transfers heat from the Earth. A ground source heat pump has a miraculous 450-percent efficiency, compared with the best furnace, which is about 95-percent efficient. If you want a Net-Zero home, pairing this system with a solar system is a perfect (albeit expensive) match. The pump costs between $30,000 and $50,000 more than a conventional furnace, boiler and AC. The pump comes in two varieties: "water-to-air," where you blow air around in ducts, or a "water-to-water" radiant system. They're about equally efficient, but only the water-to-air version can both heat and cool a home.

GREEN SAVINGS

Building green can save you green. Check out these websites for rebates, credits and incentives:

www.energysmartyes.com: a clearinghouse of Boulder County programs and rebates

www.xcelenergy.com/programs_and_rebates: utility rebates

www.cleanenergycu.org: low-cost credit union loans for solar and electric vehicles

Google: IRS credits for energy-efficient home improvements

Here are websites that offer local building info and professional guidance:

www.CGBG.org: a nonprofit trade organization of local green-building professionals

www.bouldercolorado.gov/plan-develop/energy-conservation-codes: city of Boulder energy conservation codes

www.bouldercounty.org/property-and-land/land-use/building/buildsmart: Boulder County BuildSmart regulations

—*S.R.*

Energy efficiency is not only smart, it's critical to combatting greenhouse emissions created by the burning of fossil fuels for power and heat. And though it may cost more initially to build green, the payoffs are big—for the homeowner and the planet. ❁

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