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OFF-GRID SOLAR SYSTEM DETAILS

- The Franklin’s two ground-mounted, south-facing solar arrays installed by Emerald Mountain Energy in Steamboat Springs provide the vast majority of the home’s energy needs from May through October. Sun-powered energy is stored in a bank of 24 two-volt batteries. During the warmer months, the backup propane-fueled generator only kicks on about one time a month when cloud cover lasts more than one day.
- During the colder months from November to April, the propane generator kicks on two to three times a week for a few hours in the mornings and only when clouds persist for two or more days, Paul Franklin said. The backup generator is programmed to come on when power is the battery bank drops to 65 percent capacity so that the battery quality is not degraded as quickly. The propane generator can recharge the batteries up to 100 percent, but Franklin turns off the generator at 70 percent charge as he knows the day’s sunshine will soon recharge the batteries.
- The family orders a refill of the home’s 1,000-gallon propane tank about three times as year, so they have future plans to add a third-solar array. With two daughters off at college, a tenant or in-laws moving in to the four-bedroom home is not out of the question to make the most use of the space.

SOLAR-POWERED LIVING

POSES NO PROBLEM IN STRAWBERRY PARK

BY SUZIE ROMIG

» Three miles up County Road 36 in Strawberry Park where the pavement ends and the dirt road begins marks the traditional end of utility services.

A few more miles up the road, the Franklin family lives in their beautiful off-grid solar-powered home. The solar lifestyle is not a burden for Paul and Mitzi Franklin. Spotty cell phone service and the need for satellite internet service are more of a hassle, they say.

“It’s more about making a conscious effort to turn lights out and using utilities when the sun is out,” said Paul Franklin of their passive-solar design home powered by a 6.6-kilowatt photovoltaic ground-mounted solar array and a backup propane generator.

The family does not run the dishwasher during the dark hours, and the clothes washer is used on sunny days. But the active, empty-nester couple loves their 18-acre site bordering national forest land. Mitzi often exercises their three large dogs on a trail running north through their property connecting to the Lower Bear Trail. A previous black powder hunting season, Paul rode east on horseback from their property along with their two mules for more than three hours to the Continental Divide. His trip resulted in an impressive European mount of elk antlers now hanging atop the fireplace.

The 4,000-square-foot, three-level timber-frame home completed in 2014 lays out in a L shape with simple roof lines. Franklin served as general contractor with a design by Vertical Arts Architecture in Steamboat Springs. Franklin and Vertical Arts Principal Brandt Vanderbosch worked together since 2006 on projects including the Olympian condo and commercial building in downtown Steamboat as well as homes in Elkins Meadows near Fish Creek Falls.

Built on a sloping site, the family’s home is constructed partially below ground so the lower level saves on heating. The main-level garage suite including a mud room and laundry room extends from the main house as the north leg of the L via a suspended bridge atop 15-foot steel beams.



Surrounding forest land is thinned for firewood to fuel the large custom fireplace.



Interior decor is rustic mountain contemporary in earthy, soothing tones.

SUSTAINABLE FEATURES AT A GLANCE:

- Passive-solar design including more windows to the south to gain heat and less windows on other sides of the home
- In-floor radiant heat system constructed with gypsum concrete for thermal mass to store the sun's heat, installed by Iq Plumbing & Heating in Craig
- 6.6-kilowatt photovoltaic solar array in two ground-mounted installations by Emerald Mountain Energy
- An above then-2009 code insulation package with R-30 walls with combined R-19 urethane foam and R-11 fiberglass
- Structural Insulated Panels (SIPS) ceiling with R-49 insulation value manufactured by Big Sky R-Control
- R-49 rated fiberglass insulation in attached garage
- Ground floor built into the slope for temperature control
- 300-gallon fire suppression tank located in downstairs mechanical room since the home is relatively remote and served by well water
- Three-phase variable speed well water pump to save electricity
- Forest Stewardship Council certified timbers
- Reclaimed barn wood for inside accents
- Outdoor hot tub sensors so that tub only heats on sunny days

That design element helped to save on site work on the ridgeline location.

Views to the west from the sunny living room take in Sleeping Giant. The surrounding forested land on the large acreage is thinned for firewood to fuel a large custom fireplace fabricated by Nordic Steel that is situated in the middle of the first-floor living and kitchen area.

One relatively unique feature of the home design is the use of structural insulated panels, or SIPS, in the ceiling, which works well with a simple roofline in a timber-framed home, said Vertical Arts team member Sarah Tiedeken O'Brien.

"SIPs really do lend themselves to a larger structural bay system," O'Brien explained. "They work very well with a timber-frame because it can span 20 feet, is thermally unbroken, well insulated and can reduce framing costs."

The SIPS panels, more commonly found in walls, were prefabricated at the large headquarters of Big Sky R-Control in the small town of Belegrade, Montana. The product requires six to eight weeks lead time for an order, said representative Mark Yerbic, based in Grand Junction.

"It's a unique way for a high-performance ceiling that combines framing, insulation, sheathing and air barrier in one panel," Yerbic said. "It is a time-saving material for labor and is engineered for the snow load."

Construction on the off-grid home set back from the county road up a winding driveway took only eight months, but that followed four years of thoughtful consideration at the site. The family spent plenty of time at their property they purchased in 2010, riding horses and camping in a homesteader's cabin. In past decades, previous owners of the land rode snowmobiles to the wooden cabin in the winters.

Inside the Franklin home the décor is a rustic mountain contemporary style in earthy, soothing tones with durable, classic finishes including white walls with thick, dark trim in Douglas fir and alder woods giving the home a sort of European hunting lodge ambiance. Reclaimed timbers and barn wood with touches of decades-old red paint are found throughout the home. The flooring is dog-durable with sealed and polished concrete floors on the ground level and oak veneer on other levels. Steel stair rails were welded and built on site by Doran Enterprises in Steamboat Springs. Metal light fixtures contribute to the durable yet comfortable style.

The family enjoys plenty of elk steaks sitting around the large kitchen island with its reclaimed walnut wood countertop made by Fedewa Custom Works in Steamboat. The large custom fireplace with steel top radiates heat through the functional kitchen and living room, and a tall chimney reaches to the 22-foot vaulted ceiling.

Franklin said he likes the atmosphere of log homes, but the timber-frame skeleton with highly insulated walls is a better fit for off-grid energy-conscious living. The timber-frame was fabricated off-site and assembled on site by then-Fort Collins company Powder Cache Designs, now headquartered in western Nebraska. The timbers were made out of kiln-dried, Forest Stewardship Council certified, Douglas fir, according to Andy Johnson, Powder Cache owner.

"The timber-frame has a log home feel with high ceilings and an open floor plan but is more energy efficient," Franklin said.

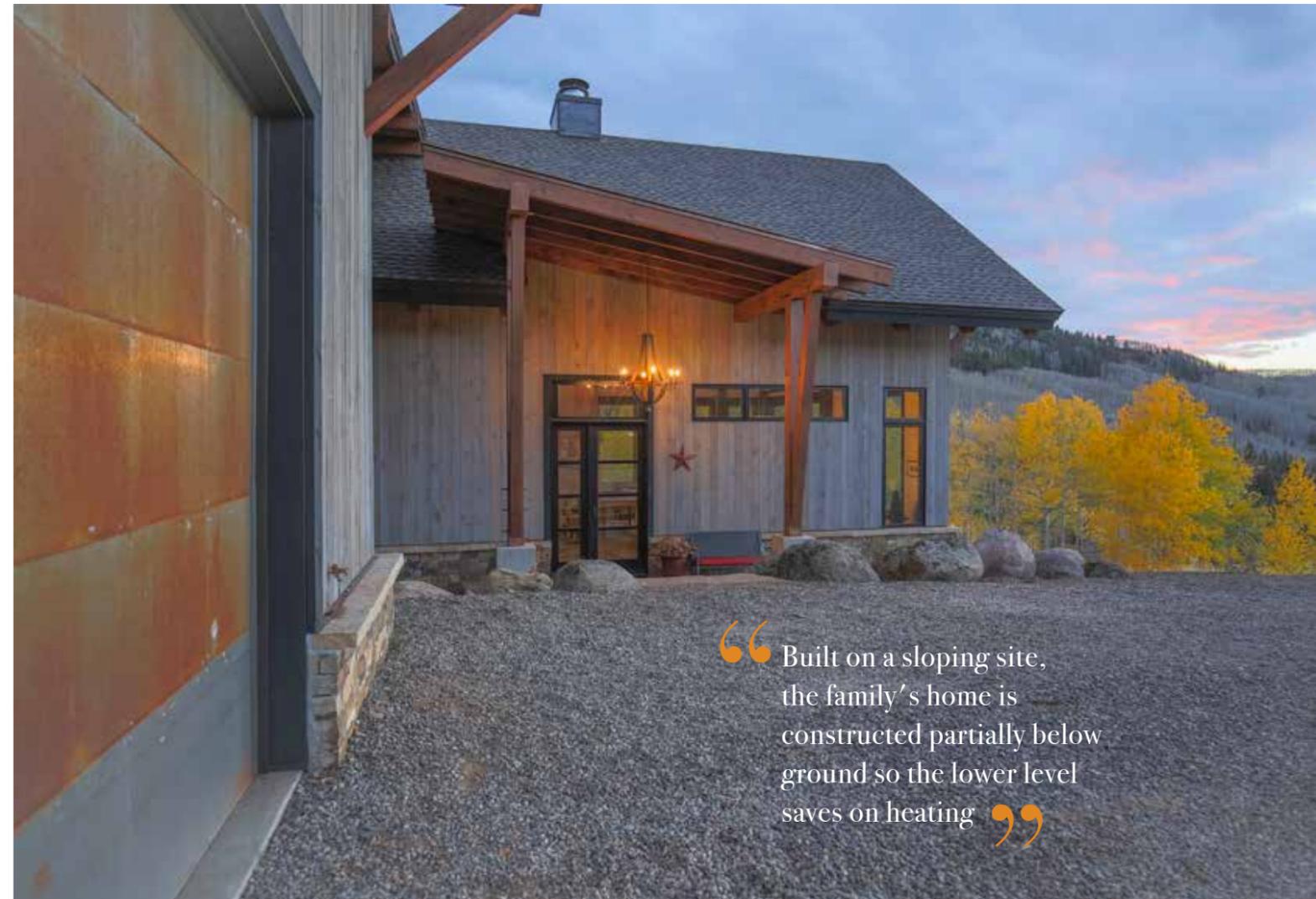
Since they enjoy the outdoors and an active lifestyle, and prefer their dogs to have freedom too, the Franklins installed a rubber-sealed, windowed garage door off the kitchen to connect to a walk-out patio with a large overhanging roof.

The garage doors may not be the most energy efficient in the windy winters, noted architect O'Brien, but the large doors do provide plenty of solar gain. Designing a home is always a balance of intent, usage and energy performance, the architect explained.

"Even though we utilized large window walls in the great room for solar gain, we took away windows in other areas of the house to try and balance the overall window-to-wall ratio," O'Brien said. She noted the residence has a simple form for a tighter building envelope with a gable roof on the main home



Steel stair rails were welded and built onsite.



“ Built on a sloping site, the family’s home is constructed partially below ground so the lower level saves on heating ”

The siding is low maintenance Douglas fir wood, combined with steel panels.

and a shed roof extending from the main house across the garage.

“It’s simple in form while utilizing an interesting material pallet,” O’Brien said.

Outside the home, the siding is a low-maintenance Douglas fir wood along with 16-gauge steel panels in a brick pattern.

The family utilizes a small greenhouse near a creek to grow carrots, beets and lots of zucchini squash. In the garden beds next to the patio they raise salad greens, more squash and strawberries, fitting for Strawberry Park Valley. In the warmer seasons, the family raises chickens.

A ground floor exercise room – complete with free weights for hockey-playing Paul and tennis-playing Mitzi – also sports a roll-up garage-style windowed door leading to an outdoor grassy area for family badminton play. This fall, a momma moose and her calf were lounging in the grassy area next to the home gym when the family’s beautiful black and white cat attempted to harass the moose. The family’s dogs had been trained not to bother wildlife in the area, Paul said, but who knew the family’s 2-year-old shelter cat would try his paw at moose harassment? The large creatures weren’t really bothered, but Paul was bummed not to have a video camera at hand to record the unexpected feline mischief.



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