

# Designing for optimal energy use

By Jim Cornelius  
News Editor

You don't have to live off the grid to benefit from designing your living environment for energy efficiency and self-reliance.

"It makes sense to engineer your house, to engineer your living environment," says Jack Addison, who designed his home east of Sisters with those qualities in mind.

From choice of construction materials to the manner in which you choose to heat and cool your home to the way you orient it toward the sun, any homeowner can improve their efficiency, reduce their energy footprint — and save money.

Addison, a pilot with an engineering background, designed his house himself, employing an architect to take his design from concept to working drawings. He "wore the nail-belt every day" during the construction, while his family lived in a studio apartment above his barn-shop.

He is quick to note that the concepts of heating efficiency and alternative sources of heat are scalable. His house is 4,000 square feet, but the concepts

are applicable — and perhaps easier to achieve — in a 1,500-square-foot space.

And the benefits of a tight, well-engineered and ventilated house accrue to the homeowner no matter whether they go off-grid or hook up to electrical power.

The first key to efficiency is engineering for heat retention.

"There's lots of pretty houses around," Addison notes. "Almost none of them are engineered. The heat loss is enormous... Houses should be sealed and then mechanically ventilated."

Addison built with insulating concrete forms — hollow foam blocks which are stacked into the shape of the exterior walls of a building, reinforced with steel rebar, and then filled with concrete. The result is exceptionally strong construction, noise reduction and a very high level of energy efficiency.

The house employs radiant floor heating in a zone pattern. There are nine heating zones, but Addison notes that in practice he and his wife only use four of the zones.

Ventilation is accomplished with a heat-recovery ventilator that circulates fresh air, but

with a minimal (approximately 3-degree) heat loss.

They derive their energy from 20 solar panels placed on the roof of their barn-shop located a few yards away from the house. The panels charge a set of batteries that provide electrical power.

The Addisons maintain a diesel generator to power their well, which requires about 100 gallons of fuel per year.

Addison noted that he and his wife did not choose solar for ideological reasons.

"We weren't against hooking up power," he said. "It was just too expensive for the return."

He notes that solar power continues to become more accessible and affordable for all kinds of homeowners.

"It'll pay for itself," he says. "The return is there."

Addison quipped that the number of panels raises an engineering question: Why 20?

"Because that's what would fit," he said.

He and his wife determined that they would simply live with the amount of power 20 panels could generate.

Their heating system is backed up with a unique



PHOTO BY JIM CORNELIUS

Insulated concrete forms help make a house energy efficient.

Finnish wood-heating system called a Tulikivi, centrally located in the house. While the Tulikivi is beautiful and highly efficient, the same kind of heating capability could be achieved with a wood stove, Addison notes.

In total, the Addisons heat 4,000 square feet off of an 80,000 BTU capability. Addison estimates that a conventional system would require as much as 300,000 BTU capability.

For about eight months of the year, they heat water solely with solar energy. During winter, they use propane to pre-heat a tank. There are many options for homeowners to heat or supplement their heating and power with multiple sources.

"There's lots of ways to do

this," he says.

Orientation of a house for maximum passive solar impact is another effective technique — but the Addisons weren't religious about it.

"We cheated a bit in favor of the view," he acknowledged.

The benefits of engineering your space, using energy-efficient materials and pursuing alternative sources of energy are many: Increased self-reliance and security during harsh winters like the one just past, a reduced environmental impact — and a fatter pocketbook.

Addison recommends that people who are interested in engineering for efficiency and using alternative power sources subscribe to *Home Power Magazine*.

"That's the greatest primer in the world," he says.

**Action Air**

A new HVAC system can save you 15 percent on your heating bill over older systems — and up to 50 percent over a straight resistance heating system. And new ductless systems are a great alternative.

Action Air offers you state-of-the-art equipment and top-notch customer service — whether you're installing a new system in new construction or retrofitting your home or commercial building.

Chris Gulick offers you quality service, a great product — and a fair price (often about 20 percent less than the competition).

Now is a great time to get your system serviced to make sure it's running at peak performance as we head into summer (it really will get here) and avoid surprise downtime.

Whether you need service, a retrofit system, or the latest and best new system, turn to Action Air for quality and hometown service.

**COMFORT FOR LIFE** **DAIKIN**

**Free Estimates!**

Daikin offers innovative concepts in energy-efficient indoor comfort solutions. A Daikin ductless indoor comfort system can make your home more comfortable while helping to lower your heating and cooling bills. Find out more from your local Daikin dealer.

**Action Air Heating and Cooling LLC.**  
**Done Right the First Time.**  
**541-549-6464**  
**ActionAirHeatingAndCooling.com**

CCB 195556  
VISA

Trade Ally of **EnergyTrust of Oregon**  
CENTRAL ELECTRIC COOPERATIVE, INC.

**CIRCUIT RIDER CARPET CLEANING**  
*of Central Oregon*

**Spring Cleaning!**  
**Residential & Commercial**  
Carpet & Upholstery  
Plant-Based Detergent  
**541-549-6471**  
35 Years Experience  
Peter Herman, Owner

**Ask for the new-customer discount!**

**YOUR WINDOW COVERING EXPERTS**

**Great pricing, top brands, excellent service.**

**Schedule your FREE Consultation!**  
**541-788-8444**  
**BudgetBlinds.com**

**Budget Blinds**  
Window Treatments for all budgets  
Locally owned & operated

CCB Licensed #197715 | Bonded Insured | 30+ Yrs. Exp.

\*Offer valid through Budget Blinds of Deschutes County only. Offer good through 3/29/17 and not valid with any other offers. Applies to selected Signature Series™ window treatments by Budget Blinds™. Some restrictions may apply. Ask for details. Offer good at initial time of estimate only. ©2017 Budget Blinds, LLC. All Rights Reserved. Budget Blinds is a trademark of Budget Blinds, LLC and a Home Franchise Concepts Brand. Each franchise independently owned and operated. Franchise opportunities available.