

## **Living a Green Dream**

By Karen Appold

Before starting a family, Chris Anderson and Anna Von Mertens had their hearts set on moving from San Francisco, CA, to Peterborough, NH, where Anna was raised and where her parents still lived. As if a cross-country relocation wasn't enough of a challenge, the couple had two other lofty goals for the move: open a branch of Anderson's business in the region and build an extremely green, off-the-grid home.

It was important for Anderson, chief technology officer of Borrego Solar Systems, Inc., Lowell, MA, a solar electric contractor, to use his business' energy saving principles and products when constructing a home.

Additionally, the couple desired a blend of their previous home, a modern open industrial loft space, and the traditional Colonial farmhouses of New England. Anderson's best friend, Peter Larsen, of San Francisco, would serve as architect.

### **Getting Started**

Von Mertens conducted Internet research to find energy-efficient and recycled products. "When interviewing contractors, she asked them how they incorporated green elements into their projects," Anderson says.

The biggest challenge for the couple was building a home in New England while still living on the west coast. Fortunately, Von Mertens' builder-turned-teacher father, Carl Von Mertens, was able to devote time to serving as the project's contractor and handling initial permits. Carl managed the construction of the foundation and garage, then in the summer of 2006, worked side by side with the couple guiding them in framing the entire house.

Eventually, Sean Macy of Frost Pond Timberframes took over as the builder. "The home is unique in many ways, but what stands out is the amount of work that the couple and their family put into the project," Macy says. The home was completed in 2007.

### **Selecting a Sunny Spot**

The couple selected their home site with the intent to preserve open farmland and forest from subdivision development. The home's broad side is oriented southward. Therefore the roof, which contains 42 photovoltaic panels and seven solar thermal hot water panels, is positioned for maximum solar gain, Larsen explains.

The solar panels provide the primary source of power to the 2,850-square-foot, three-bedroom home by harvesting energy during the day. An inverter in the basement converts the energy into electricity. Power is stored in batteries during

the night. "When the sun isn't out, the home runs on battery power," Anderson explains. "When the batteries are depleted, the charge controller signals the generator to charge them." During the winter, the generator runs once or twice a week. A wood pellet burner serves as a back-up source of heat for the hot water system.

### **Green Elements Abound**

For the couple, it was important to build green whenever possible. Durable and low-maintenance materials were selected from sustainable sources. Pine trees were felled and milled on-site for siding, flooring and cabinets. Exterior cedar shingles and siding as well as Ipe decking offer endurance, rot-resistance and beauty, and were left unfinished to weather naturally. A standing seam metal roof has a 50-year lifespan.

Additionally, triple-pane Loewen windows are constructed from wood certified by the Forest Stewardship Council (FSC) and feature exterior aluminum cladding for longevity. Paint finishes were chosen without volatile organic compounds. Blown-in foam insulation is thermally resistant. Energy-efficient appliances and fluorescent lighting further the efficient use of the generated power.

Heat is provided with in-floor hydronic radiant heat systems, which influenced the selection of concrete floors for the main living spaces. Slag concrete was used instead of Portland cement (which emits significant carbon dioxide).

Concrete was also used for the countertops. "I love the way they came out--their light and irregular color, the way they meet the soapstone sink, the big backsplashes and the thick profile," Macy says.

It was important that the landscaping also be green. A local landscape architect planted perennial bulbs that will naturally bloom each spring as well as local species. A conservation mix of grasses was planted 30 to 40 feet around the home, which is built in a field.

### **Realized Dreams**

Overall, the primary sustainability feature of the home is integrating efficient assemblies and systems into a valuable, long-term, enjoyable space built to endure for generations, Larsen concludes.

With daughter Hayden born two years ago, Anderson and Von Mertens are fully living the dream they envisioned back in San Francisco.

"The \$600,000 cost is well worth it," says Anderson, who estimates having paid 20 percent more in building sustainably and being off-grid. The difference will more than pay for itself through avoided operation and maintenance costs over the home's lifetime.

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