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SPECIAL REPORT: A LOW-COST ENERGY FUTURE

A House That Costs Nothing to Run

Meet the Moomaws. Their goal is to build a retirement home in New England that will produce as much electricity as it consumes

Ask the average person to describe their dream retirement home, and what will you hear? Visions of high ceilings, gourmet kitchens, an expansive yard, maybe even a Jacuzzi. Bill and Margot Moomaw, a couple from Massachusetts, have a totally different kind of dream: They want a retirement home so efficient that it actually produces as much electricity as it consumes.

Now, three-or-so years away from retirement, Bill, a 67-year-old professor of international environmental policy at Tufts University, and his wife, 64, are about to break ground on a painstakingly planned low-energy dream home in Williamstown, in Western Massachusetts (see **"The Moomaw's Model Home"**). While the house will employ a lot of special technology, ranging from solar panels to a geothermal heat pump, the first rule is that their future residence house must look and feel "normal."

MODERN LIVING. The architecture will match turn-of-the-century New England-style houses in the area. And the home will have a TV, computers, a washer/dryer, and other typical amenities.

"We're not going into a cave and using candles," says Bill. "We want to show that you can [be energy-efficient] by buying common brands" adds Margot. "You just have to do careful shopping."

The Moomaws couldn't have picked a better time to reduce the amount of outside energy they consume. Heating oil and natural gas prices have reached record highs in recent weeks, as supply lines and refineries have been shut down by Hurricane Katrina and increasing global demand continues to put a pinch on supply. No less a consideration, U.S. power grids are increasingly coming under strain.

"THE LEARNING CURVE." Building the home will be no small task. The couple, who have two children in their thirties, have spent the past year calculating all of the details, translating each and every component of their home life into a complex energy-arithmetic problem.

Starting with how much power they can create with the 63 solar panels they'll be installing on the roof, they've examined exactly what level of insulation the house will need, the precise position where it must sit on the lot to get optimal heat from sunlight in the winter, and even the right model of dishwasher and brand of light bulbs.

Energy-efficient living isn't a new interest for the Moomaws. The couple's first venture into the area was during another period of skyrocketing oil prices, in 1973. Back then, with Bill a young member of the chemistry faculty at Williams College in Williamstown, Mass., the couple started making adjustments to their house to make it less dependent on oil in order to both help the environment and save money.

Their project started with window replacements and new insulation. Four years later, they bought a solar-powered water heater. "We've been on the learning curve since then" says Margot, "and have always made incremental improvements" on subsequent homes.

STILL ON THE GRID. This time they want a real challenge. When they met with a local engineer and architect to talk about their plans, the first proposal was to make their new home an Energy Star house -- a special classification awarded by the U.S. Environmental Protection Agency for homes that use 30% less energy than the average for similar size residences.

That classification can entitle homeowners to special perks and rebates from their utility, but the Moomaws weren't satisfied. "We said, 'Well, that's pretty good,'" recalls Margot. "But we thought we could easily get to just 50% to 70% of normal energy use. [So we made] the stretch goal a 100% reduction."

To realize this won't be as easy as just installing a bunch of solar panels and cutting themselves off from the power grid. New England isn't sunny enough for that, and batteries used to store solar power can be expensive and inefficient, says Bill.

BUYING -- AND SELLING. So the couple plans to engage in a seasonal give-and-take with the local utility. During the winter months, when days are short and direct sunlight is scarce, they'll get most of their energy from the local power grid.

In the sunny summer, the Moomaw's 63 solar panels will collect and store more than enough energy for their needs, and the couple will sell the excess back to the local utility. At the end of the year, they hope, the total net energy consumption will add up to zero.

If they get off to a rough start, the Moomaws will be able to rely on the grid, so they won't be left in the dark. "For Margot and me, [the goals are] to be free of fossil fuels and build a house that recognizes the environmental and resource constraints we're all facing," says Bill. But then, he adds, "not having to pay any energy bills in this day and age also has its satisfactions."

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Nickname: No Way In SC
Review: I built my energy-efficient home that is also hurricane- and tornado-proof (Category 5) but in South Carolina you can't have a net zero electric home. The state of South Carolina doesn't even know what net metering is. Will someone please help.
Date reviewed: Sep 21, 2005 1:41 PM

Nickname: Dan
Review: This is a step in the right direction. The earthship house idea from Michael Reynolds takes this concept to the next level and is completely self-sustained. No utility bill is a great thing.
Date reviewed: Sep 20, 2005 9:58 PM

Nickname: Nick
Review: Very impressive to see another good example by people with vision. Alternative energies and efficiency adaption are essential in a world where bought-in energy can now be of strategic disadvantage eg. French nuclear electricity and Russian gas power England. Many British people would adopt a similar solar electricity plan but our insane tax system prevents it! It's impossible to become more efficient and generate power here without paying huge taxes to local council planners and central government who have nothing better to do than stop progress.
Date reviewed: Sep 20, 2005 7:46 AM

By **Burt Helm** in New York