



Can This Home Be Greened: Earth-Friendly Expansion

By Matthew Morris

Driving along the country road to Ann Rauch and Michael Goldblum's house, it's hard to believe you're only a few subway stops from Manhattan. The Bronx, New York, 1930s-era, 1,770-square-foot home has a spacious front yard that provides an urban oasis for the couple and their children: Emma, 13, and Nathaniel, 10.

Though the location is ideal, the family is rapidly outgrowing the small home as the children get older. "Our shared bathroom feels smaller by the minute as our kids grow and spend more time there," Ann says. In addition, Nathaniel is cramped in a half-bedroom, and there's no room for entertaining: Dinner guests serve themselves buffet style, and the kids sit on the floor. The washing machine is squeezed into the crowded, galley-size kitchen.

The family recently decided to go ahead with the renovation they've been talking about for years. Michael, an architect, designed a 1,200-square-foot addition over the existing family room that will provide a new master bedroom, guest room, bathroom and laundry room. There will also be a build-out in the front and back of the house to create a dining area and sunroom.

The renovation gives the family a chance to incorporate green building practices and reduce their high monthly energy bills. Their goal is to earn the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) certification.

Priority 1

Replace the Inefficient Windows

Problem: The existing windows lose energy, and some of them are difficult to open.

Solution: Ann and Michael's windows lose a great deal of heat, so replacing them with Energy Star-labeled, wood-frame, double-glazed, low-E models will greatly improve the home's energy efficiency. Windows that open easily will allow natural ventilation and reduce the need for air conditioning on temperate days.

Cost: Approximately \$1,500 per window, installed.

Priority 2

Upgrade the Insulation

Problem: The home's exterior walls are poorly insulated, and air leaks out around doors and windows.

Solution: Recycled-content cellulose insulation can be blown into the uninsulated wall cavities and attic. In the addition, the couple can add nontoxic recycled-denim insulation during construction. After the new addition is complete, Ann and Michael should hire an Energy Star contractor to evaluate the home's airtightness and seal any leaks.

Cost: Blown-in cellulose insulation: \$1 per square foot. UltraTouch recycled-cotton insulation: \$1 to \$2 per square foot, depending on its R factor. Energy Star blower door test and audit: \$350.

Priority 3

Overhaul the Heating System

Problem: The house's original, oil-fired boiler was inefficient and expensive to maintain. One morning Ann found a thin film of black dust on the furniture and realized the boiler had experienced a "puff back" that spread soot throughout their home.

Solution: It was more cost-effective—and less risky—to replace the old boiler than to repair it. Not wanting to risk another sooty malfunction, Ann and Michael chose a sealed-combustion boiler with electronically controlled gas pressure to keep the output constant. The new boiler is cleaner and sized appropriately to heat their more energy-efficient home.

Cost: New boiler (installed): \$5,000.

Priority 4

Improve the Shabby Flooring

Problem: The existing hardwood floors are worn, and the stairway carpet is threadbare. The attached cement-floor garage is

drafty, so it's used for storage instead of more living space.

Solution: Instead of replacing the wood floors, Ann and Michael can sand and reseal them with a low-VOC finish. A durable new runner made of undyed wool fibers and low-toxic adhesives should hold up to heavy stair traffic. The couple could make the garage a functional exercise and play area by insulating the walls and installing a cushioned, recycled-rubber floor surface.

Cost: Water-based polyurethane wood sealer: \$2 per square foot. Wool carpet: \$12 per square foot, installed. EcoSurfaces recycled-rubber flooring tiles: \$11 to 16 per square foot, installed.

Priority 5

Fix the Bathroom Fixtures

Problem: Adding new bathrooms will alleviate space issues, but Ann and Michael are concerned about maximizing their water efficiency.

Solution: The new bathroom should include a dual-flush toilet and low-flow fixtures. They can add faucet aerators and a low-flow showerhead to the existing bathroom and, within the next few years, replace the toilet with a water-saving model. To reduce the family's exposure to chemicals from the municipal water supply, they should install chlorine filters for the showerheads and consider a whole-home filtration system.

Cost: Water-saving showerhead: \$10 to \$50 depending on model. Dual-flush toilet: \$400. Showerhead chlorine filter: \$20. Whole-house water filtration system (custom designed, installed): \$5,000. Self-installed Aquasana Whole-House Water Filter: \$1,100 (www.AquasanaStore.com)

Matthew Morris is a sustainability consultant with New York City's Deep Green Living (www.DeepGreenLiving.com), which helps clients make their living spaces healthier and more environmentally friendly.