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Modernist Without the Markup

Nearly a decade ago, a Washington, D.C., family set out to build a sustainable home for around the same price as a conventional one. Think it can't be done? Here's how they succeeded.



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PHOTOGRAPHY BY
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Building an eco-friendly dream home for about the same cost as a conventional home seemed daunting when my husband, Luke, and I bought three acres of Virginia forest nearly eight years ago. Our purchase came just before the dot-com crash (Luke owns a software company); shortly thereafter our funds would have evaporated.

Believing fate was on our side, Luke, our two children and I set out to build an environmentally conscious home for no more than 5 percent above the cost of a conventional one.

The homeowners hired an arborist to inventory existing species, relocate large trees, install root-aeration mats and put up tree fencing. After the house was finished, regrading approximated the land's natural contours. A terraced rain garden slows runoff from the driveway.

9 LESSONS FROM A GREEN BUILDER

1. MAKE DESIGN CHANGES WHILE THEY'RE ON COMPUTER AND PAPER RATHER THAN IN THE FIELD—IT'S A LOT CHEAPER. Take advantage of the drafting software program AutoCAD (www.AutoDesk.com), which makes viewing interiors easier. Our architect included this service at no additional charge.

2. CLEAR COMMUNICATION IS CRITICAL. When possible, deal directly with those who perform a service or make a product. Properly recording decisions can save money and time.

3. PROVIDE AMPLE OPPORTUNITY TO STORE THE SUN'S HEAT. Houses designed to maximize solar gain need concrete and extensive stone surfaces to capture and radiate heat back into the house after the sun goes down.

4. BEWARE OF GREENWASHING. Hire good advisors. Ask questions, and if you don't get satisfactory answers on a product's materials and sourcing, choose another product.

5. WHAT'S GOOD FOR THE EARTH IS OFTEN GOOD FOR YOU. New cabinets, furniture and carpet can outgas toxic chemicals for years, contributing to indoor air pollution and possibly asthma. Avoid medium-density fiberboard (MDF), pressboard and particleboard interiors, which contain formaldehyde.

6. AVOID "BOUTIQUE" APPLIANCES. Choose appliances based on energy efficiency first, brand reliability second, and aesthetic and other features third. Refrigerators with freezers on the bottom are best, because they take advantage of the natural properties of air movement: Heat rises, cold falls.

7. CHOOSE GREEN FLOORS. Ask for carpet with the highest amount of post-consumer (best) or post-industrial recycled face fiber. Also look for carpet made with nontoxic adhesives. Select cork or certified-sustainable hardwood.

8. QUALITY DETAILS COUNT. Don't skimp on good design and finish materials, which reduce waste by lasting longer. Remember, however, that less is more. Do you really need molding and wainscoting?

9. USE LOW-VOC PAINT. Avoid the darkest colors, which fade in sunlight and contain the most toxic volatile organic compounds, or VOCs.



A childhood friend of Luke's built the 8-square-foot table out of stainless steel and certified sustainable maple and walnut.



The fireplace has a recycled-concrete mantel, which is key to retaining and radiating heat in the great room during winter. The blue, Cassina "Dodo" chair reclines flat and has an optional footrest.

We set our goals high; we wanted to use green products, but they had to be cost competitive—within 5 percent of a comparable mainstream product. Luke and I vowed to limit waste by choosing a clean design style, ordering supplies conservatively and salvaging whenever possible. As a conservation policy consultant, I'm passionate about the environment, and our subcontractors began to understand my ardor when I climbed inside the Dumpster one day to retrieve a good piece of drywall.

The plan takes shape

To disturb the natural landscape as little as possible, Luke and I planned for site preservation six months before construction began. We hired a professional arborist, RTEC Treecare, to assess the health of all trees within 50 feet of the project footprint. The company surrounded the entire impacted area with tree protection fencing and helped strengthen trees within 20 feet of the disturbance area with root aeration mats.

We worked with the company to develop a set of tree-protection rules, including financial penalties for violations, and made all contractors sign it before entering the job site. These tree-protection measures cost \$34,000—about one-third of our total landscaping costs—but I consider it money well spent. It was an additional expense, but by contrast, our neighbors just finished construction without any tree-protection measures. They spent nearly \$10,000 to fell three 100-foot trees killed by construction impact. We kept our beautiful trees—and their cool shade.

Our architect, Bob Wilkoff of Archaeon Architects, sited our home on one of the land's natural slopes to utilize the

THE GOOD STUFF

- Passive solar orientation with UV-filtering shades on southern side
- Thorough tree preservation work by certified arborists
- Recycled-content steel framing and concrete
- Energy Star HVAC (heating, ventilation and air conditioning) system with efficient heat exchanger
- Floors made of FSC-certified wood and cork
- Carpet made from natural wool and recycled plastic
- FSC-certified maple kitchen cabinets with wheatboard interior cores and VOC-free finishes
- Low- and zero-VOC paints
- Low-E glazed, doubled-paned, argon-filled, wood-framed casement windows. While these windows cost more than conventional, they're around the same price as premium, custom-sized designer windows. This was an area where we chose sustainability (energy efficiency) over luxury (custom-sized, designer windows).
- Extra-high R-value formaldehyde-free insulation
- 100 percent recycled-content drywall
- Decks made of FSC-certified ipê wood and Trex (wood/plastic composite)
- Local stone used in terrace, garden paths, landscaping
- Native species planted in tiered gardens to filter driveway runoff before it reaches Potomac River tributaries
- Rainwater catchment used for irrigation
- Most furniture designed with eco-friendly, natural fabrics
- Energy Star appliances
- Energy-saving light fixtures; Smart Home dimmer system
- Long-lasting soapstone kitchen counters
- Bathroom countertops made of salvaged stone and recycled-glass composites
- Low-flow, motion-activated sink faucets (price in line with the conventional Kohler faucets our builder planned for in the budget)
- Low-flow toilets
- Permanent conservation easement planned

moderating effect of the Earth's temperature; this is one of the most energy-saving aspects of our home. In summer, it can be 10 degrees cooler on the lower level than in the upstairs bedrooms, so each July we move downstairs to our "summer home." In winter, the window placement and second-story overhang help us exploit the sun's warmth on our south-facing spaces.

To build the house, we contracted Jeff Carpenter, founder of the custom building company Monticello Homes in Fairfax Station. Although he had little green building experience (which was the case with most builders in this area a decade ago), Jeff was committed to building sustainably while staying within the project's budget. His homebuilding planning method was to budget each individual category: He gave us the estimated prices of the average conventional products we would need in each category, and we added our 5 percent premium to get each category's individual budget ceiling. When we were under budget in certain categories, we could put the excess funds toward another, more expensive item somewhere else. One of Jeff's biggest concerns was that his usual suppliers wouldn't carry recycled concrete, drywall, insulation and countertops. To our surprise, in many instances they did—*without* a premium price.

Searching for green

Although sometimes we located items very easily, finding green products for building and landscaping was a challenge. I used the Internet to track down essential items such as insulation, drywall and hardwood flooring, and our team relied heavily on the grow-



The breakfast room's oval Saarinen Table—designed so no one gets stuck sitting over a leg—was given a restored Formica finish. Natural hemp slipcovers on the chairs, in Galbraith and Paul's "Donuts" fabric, feature hand-applied natural dyes.



The kitchen has FSC-certified maple and wheatboard cabinets, and its counters are made of soapstone, a beautiful, stain-resistant surface that retains heat.

ing community of environmental groups to find resources. A nonprofit organization, Programme for Belize, for which I once raised conservation project funds, helped me find the ipê wood for our deck. The BuildingGreen suite of online tools, available by subscription at www.BuildingGreen.com, was vital; it includes a green products directory with more than 2,000 listings, along with case studies for \$199. The Forest Stewardship Council (FSC) was invaluable; it certifies wood products through the supply chain (www.FSCUS.org).

Green carpet proved difficult to find because so many brands include toxic glues, nylon or other environmentally

harmful materials. I interviewed a dozen sales representatives to determine the fibers' post-consumer recycled content, what was in the backing and whether the carpet could be recycled after its useful life ended. Perseverance paid off, and I found a few companies—Lees, Shaw, Mohawk and Interface—that supplied responsible products for reasonable prices.

Occasional disappointments cropped up: Recycled roof shingles were absurdly expensive, and county regulations wouldn't allow us to have a green roof with live plants. To keep within our 5 percent rule, we opted for a conventional product—asphalt shingles—but we did choose the 40-year



shingle, so at least we know the roof will last a long time. In addition, a company that agreed to supply locally mined soapstone for our kitchen counters reneged, forcing us to order from a Brazilian company at the last moment. I considered switching to recycled countertops but stuck with soapstone because it's beautiful and stain resistant, retains solar heat, and requires only a nontoxic mineral-oil finish.

What's inside counts

It was surprisingly easy to find appliances, furniture and décor that met our environmental, aesthetic and financial criteria. Barbara Hawthorn, an interior designer who once worked for the Environmental Protection Agency, helped us choose natural wood furniture and gorgeous eco-smart fabrics. She selected

Knoll Textiles for our furniture upholstery because many of the styles have some reclaimed content or use natural fiber—and they're durable, which is important to a family with children.

Barbara's and my design choices were rooted in our shared admiration for Modernist classics. Several of our tables are vintage pieces, rescued from yard sales. A childhood friend of Luke's used sustainably harvested wood and hand-applied nontoxic finishes to make our dining room table and an egg-shaped, hollow coffee table.

Our bedroom's wall-to-wall carpet, from Mohawk, is manufactured from 100 percent post-consumer recycled PET (polyethylene terephthalate) polyester. Thousands of soda bottles were melted down and spun into plush broadloom roll carpet. We splurged on natural wool area rugs in