By Michael Tardif

Green Houses

Here are tips for how to make your home more ecofriendly—and save money.

Architect Travis Price designed this addition to a DC home overlooking Rock Creek Park. Floor-to-ceiling windows help warm the house in winter but are shaded in summer.

LET'S SAY YOU bought a home a few years ago, and it was on the cutting edge of design trends. It had an open-plan kitchen and family room, a master-bedroom suite, a high-tech media room, and a wired office.

Now along comes "green" design, and your high utility bills are a sure sign that your home is out of step with this most recent trend.

To go green, you don't have to spend big money and put solar panels on your roof. There are many other ways to help the environment and save money.

A green home consumes as little water and energy as possible. But green design also considers the health and environmental effects of the home's building materials. Even if those materials are natural, how were they extracted from the earth or harvested? How much energy was consumed? What damage was done to the environment?

Many architects and contractors are eager to show that green design can be part of projects big and small. The former District Design Development Group, now 3DG, is renovating a townhouse in DC's Columbia Heights into two condos using reclaimed historic heart-pine flooring, salvaged-wood framing, rapidly renewable cork, carpeting made of recycled soda bottles, and ceramic and terrazzo tile made of 50-percent recycled content.

Ecofriendly design might seem an extravagance, but it's often a good investment. Building materials that require less energy to produce, use natural resources more efficiently, and can be disposed of safely often cost less than their energy- and resource-intensive counterparts.

Here are ways to get started:

Seal it up. Have a contractor do an energy audit. For a few hundred dollars, you might be able to lower your energy costs by as much as 30 percent by adding insulation and sealing cracks around doors and windows. Installing insulated windows and doors is a bigger investment but can pay for itself in a few years in reduced energy costs and possibly a federal tax credit.

Go tankless. Most homes are equipped with large water heaters that use lots of gas or electricity. For a $600 to $1,000 investment, a tankless heater can provide hot water whenever you need it while cutting your energy costs by as much as 40 percent.

Don't demolish; deconstruct. Renovations generate trash that is expensive to haul away and takes up landfill space. Your project can be greener if you "deconstruct" and donate those materials. Deconstruction could cost a little more, but that may be partly—usually fully—offset by lower disposal fees and the tax deduction if you donate the salvaged materials to nonprofit salvage organizations such as Community Forklift in Edmonston or Habitat for Humanity's ReStore in Gaithersburg.

Buy local. Native hardwoods such as oak, maple, and ash require less energy to harvest and transport than tropical woods

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such as mahogany.

Buy raw. Wood veneers use only thin layers of exotic wood, but their manufacturing consumes energy and uses adhesives that might give off volatile organic compounds. In air-conditioned homes rarely opened to fresh air, a high concentration of these compounds can contribute to such serious illnesses as asthma.

Buy renewable. When using natural building materials, choose those that grow rapidly, require little or no artificial fertilizers, and are easily harvested. Bamboo, which first appeared as an alternative to wood flooring, is now used to make cabinets and countertops. It's a grass that grows much faster than wood and is harvested using much less energy. Cork, which is actually bark harvested from living trees, is another excellent choice for flooring.

Strawboard, made of wheat or rice straw, is a good green alternative for interior walls.

Use brick. Brick? Yes, it's one of the greenest building materials.

Brick's raw materials, typically clay and shale, are found closer to the earth's surface than copper, iron, or steel and are more easily mined. Unlike other manufactured building products, nearly all of that raw material ends up in the brick—an attribute known as "high resource utilization."

Rick Harlan Schneider of Inscape Studio used green materials to renovate a historic Adams Morgan house and create this evening garden, which uses cedar fences as walls.

Helicon Works architect William Hutchins designed an addition for his Takoma Park home with straw-bale exterior walls, salvaged wood, and reclaimed furniture.

Brick provides great insulation and is manufactured in 39 states, so the total embodied energy due to transportation is relatively low.

Forget the cement. For driveways, walkways, and terraces, concrete decorative pavers support heavy loads yet allow water to percolate into the earth rather than running off into the stormwater system. Annapolis-based landscape architect Jay Graham cautions that gravel is not a good solution; it compacts and can block the flow of water.

Keep paved areas to a minimum. In the 1930s, people often paved only the tire tracks of a driveway—a good green strategy.

Tap the earth's heat. If your house has central heat and air conditioning, you probably have one or more fan-coil units sitting on a concrete pad in your yard. These absorb heat from the air during the winter to warm the home and discharge heat to it during the summer.

This system functions least efficiently when it is needed most—at the peak of hot and cold weather, when energy costs go up.

Geothermal systems, which warm and cool homes by exchanging heat with the subsurface earth instead of air, promise more efficiency and lower costs. When architect Ken Terzian of OPX, a District firm, and his wife installed central air in their Forest Hills home four years ago, they replaced steam radiators with such a system. Vertical wells were drilled into the ground to create the closed heat-exchange loop. The system cost $10,000 more than a conventional heat-pump system, but it saves the Terzians about $2,000 a year in heating and cooling. Silent operation is an added bonus; geo-

Resources for Green Design

ARCHITECTS

Envision, 1211 Connecticut Ave., NW, Suite 250; 202-775-9000; *envisionsite.com.*

HD Squared Architects, 3201 Belleview Ave., Cheverly; 202-436-5311.

Helicon Works, 7108 Holly Ave., Takoma Park; 202-332-7949; *heliconworks.com.*

Inscape Studio, 1215 Connecticut Ave., NW, third fl.; 202-416-0333; *inscapestudio.com.*

OPX, 21 Dupont Cir., NW; 202-822-9797; *opxglobal.com.*

Terraplane Studios, 1417 Newton St., NW, Suite 108; 202-265-1660; *terraplanestudios.com.*

Travis Price Architects, 1111 34th St., NW; 202-965-7000; *travispricearchitects.com.*

Wiencek & Associates Architects & Planners PC, 3 E. Diamond Ave., Suite 100, Gaithersburg; 301-948-6220; *wiencek-associates.com.*

CONTRACTORS; DESIGN/BUILD FIRMS

3DG, 2121 Wisconsin Ave., NW, Suite 320; 202-298-6636; *3dgllc.com.*

Landis Construction Corporation, 7059 Blair Rd., NW, Suite 300; 202-726-3777; *landisconstruction.com.*

DECONSTRUCTION CONTRACTOR

DeConstruction Services, 8929 Colesbury Pl., Fairfax; 703-280-1719; *deconstructionservices.com.*

BUILDING-MATERIAL SALVAGE AND RESELLERS

Brass Knob Back Doors Warehouse, 57 N St., NW; 202-265-0587; *thebrassknob.com.*

Community Forklift, 4671 Tanglewood Dr., Edmonston, Md.; 301-985-5180; *communityforklift.com.*

Habitat for Humanity ReStore, 9100 Gaither Rd., Gaithersburg; 301-947-3304; *habitat.org/env/restores.aspx.*

ONLINE RESOURCES

Building Materials Reuse Association; *buildingreuse.org.* A Pennsylvania-based nonprofit organization that facilitates building deconstruction and the reuse or recycling of recovered building materials. Its Web site includes a nationwide directory of association members.

Efficient Windows Collaborative; *efficientwindows.org.* Helps you compare the efficiency of products on the market.

Green Seal; *greenseal.org.* Certifies environmentally responsible products and services with its Green Seal of approval.

Greenguard Environmental Institute; *greenguard.org.* Like Green Seal, but it focuses on certifying products and services that affect indoor air quality.

US EPA Energy Star Program; *energystar.gov.* The EPA's comprehensive information resource for home improvement, new home design, and energy-efficient appliances, lighting, and other products.

thermal systems eliminate the noisy backyard fan-coil unit.

Power your home with wind energy. Most area utilities allow customers to buy electricity from wind-power providers. The Terzians buy wind-powered electricity for their home through their regular utility. Their added cost is about a dollar per day, or 15 percent more than the cost of conventional energy from fossil or nuclear fuels. Washington Gas Energy Services says wind power increases your cost 25 to 40 percent—a big jump—but it makes a huge difference in reducing overall carbon emissions.

Make the sun work for you. While solar energy is worth considering when building a new home, it's rarely practical or cost-effective for owners of existing homes. The cost and limited capacity of a solar retrofit could mean a long payback for what might be a small reduction in fossil-fuel consumption.

Your money is far better spent on increased insulation, reduced air infiltration, and high-efficiency energy systems such as tankless hot-water systems.

"Passive solar" design features, on the other hand, can yield significant benefits, cutting heating and cooling costs by as much as 40 percent, according to research. Openable skylight windows, for example, can create a chimney effect that draws hot air up and out, reducing the need for air conditioning. Roofs with deep overhangs can shade windows from high-angle summer sun while admitting low-angle winter sun. Limiting the number and size of windows on the north side of your house while maximizing summer-shaded windows on the south side can also help.

Landscape architect Graham makes the yard part of a more energy-efficient home. He plants trees strategically for summer shade and protection from winter winds. A single large tree can shade and help cool an entire house during the summer, then drop its leaves in the fall to let in the winter sun.

Graham likes to use native plants. "If you get them in the right spot and past their initial establishment periods, they will do fine," he says. "They also tend to be deer-proof and require little or no irrigation or fertilizer." He recommends oak and willow oak on the south side. "Red maples are not as tall but provide good shade," Graham notes. "Black gum, while not a major shade tree, is a very handsome native with beautiful fall color."

A screen of dense evergreen trees can provide an effective windbreak. Plant as many trees as you can. Green roofs and rain gardens can also retain water and slowly release it to plants, reducing runoff into the stormwater system.