

1. When the owners of this Seattle home expanded by adding a second story, architect Tim Hammer called for high ceilings and clerestory windows to bring in as much natural light as possible. The windows can be opened for ventilation using remote control.



▲ The new kitchen features a stainless steel sink, countertop and range hood—easy to clean and maintain and exceptionally long-lasting. The steel kitchen fixtures were custom made in Ballard, just 5 miles from the home.



1.

2.

3.

2. Cabinetry made with minimal use of volatile organic compounds benefits both the family's health and the environment as a whole.

3. The home's radiant heating system uses recirculating hot water to save energy and reduce dust and allergens—and is quite inconspicuous.



4. Although they look new, these glistening hardwood floors were retained in the remodel, safeguarded during construction and refinished afterward.

5. Large doors bring in natural light to the dining nook, and allow for ample ventilation during warm weather.

Saving Graces

Green retrofit projects create clean, comfortable living spaces | **By Renee Brincks**

When Jon and Mizuki Anderson made plans to remodel their home in Seattle's Belvedere Terrace neighborhood, they weren't aiming for sustainability awards. The couple simply wanted more space for their three young children, and they hoped to update the 1947 structure with design elements from Mizuki's native Japan.

"It was about using the space as efficiently as possible," says Jon Anderson. "We just needed to optimize it for our life."

Working with Seattle-based Cast Architecture and the contracting firm Model Remodel, the Andersons outlined an airy plan that took the house from two bedrooms to four by stacking a second story atop the original structure. In the process, the design and construction team encouraged the family to pursue Built Green certification. Developed by the Master Builders Association of King and Snohomish Counties (MBAKS), the voluntary program establishes environmental standards for construction materials, energy efficiency, water use and indoor air quality.

The green building concept resonated with Anderson, a Northwest native and former Boy Scout.

"It's like leaving a campsite better than you found it. We can leave the environment a better place, and we can do that within our budget," he says.

Anderson joins an increasing number of homeowners applying green building practices to renovation projects. Driven by the desire to conserve



▲ Best results from green retrofits are obtained by a thorough review of the homeowners' budget, lifestyle and objectives.

resources, cut utility bills, decrease chemical exposure and boost resale values, families are investing in more than just energy-saving LED lights and low-VOC paints. Forty-nine percent of respondents in one poll listed eco-friendly home features as more important than luxury items, reports the nonprofit U.S. Green Building Council (USGBC), and estimates suggest that green single-family homes will represent as much as 33 percent of the market by 2016. More than 71,000 residential units have

received the USGBC's Leadership in Energy & Environmental Design (LEED) home certification since the program's 2008 launch.

In the Puget Sound area, Built Green has certified more than 25,000 living units in the past 15 years, including more than 50 percent of Seattle's new residential construction in 2014. The Andersons' home renovations earned Built Green 4-Star certification (the program awards 3-, 4-, 5- or Emerald Star ratings) and won an MBACKS Green Remodeling Excellence award. Contractors reused existing hardwood floors, installed efficient doors and beefed up insulation. Well-placed, efficient windows let in natural light that warms and brightens the home. A high-performance radiant heating system produces additional savings, and it eliminates the allergy-inducing dust scattered by the furnace it replaced.

Define your goals.

Before beginning a project, discuss your priorities and values with contractors. "Determine what that pain point is," says Bruce Mast of Build It Green. High utility bills, for example, may indicate the need for exterior improvements or a new heating system.

Know your environment.

"What you do with your home is very much affected by the amount of moisture in the air, the average temperature and the extremes you're experiencing," says the Cold Climate Housing Research Center's Jack Hébert. Tailor improvements to your region.

GREEN BY DESIGN

Be flexible.

Seattle homeowner Jon Anderson wired his garage for a charging station, so he's prepared if he or a future homeowner buys an electric vehicle. "Be open to opportunities that arise when the contractors are on site," he says.

Document the value.

Aaron Adelstein of Built Green recommends tracking the savings generated by green retrofits. "At the time of sale, people are asking and expecting more around how a home performs," he says.

REAL ESTATE

The remodeled home features a light environmental footprint without sacrificing modern aesthetics.

"People don't tend to associate green building with high design," says Cast Architecture's Tim Hammer, who oversaw the Andersons' renovations. "But today, we're able to follow sustainability guidelines and create beautiful homes in the same project."

To get clients thinking about sustainability, Seattle-based Model Remodel owner Jason Legat starts by discussing a family's needs and lifestyle, after which he suggests materials made with recycled content, reclaimed lumber and formaldehyde-free components.

"At the beginning of a project, some clients don't have the intention of doing a sustainable project. But we show them options, and sometimes the prices are

the same or even less," Legat says.

While some green building practices require an upfront investment, agencies such as Energy Upgrade California, the Washington State Housing Finance Commission and the Oregon Department of Energy can help offset costs. Homeowners also record long-term savings through lower utility bills.



MORTY BAKUSEN / GETTY IMAGES

◀ It may seem old hat by now, but boosting attic insulation is still an effective way to save energy and money. Simple apps help homeowners quantify the savings.

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Those small savings add up to real financial and environmental benefits, explains Aaron Adelstein, who oversees Built Green as MBAKS director of association programs. Built Green's 25,000 certified residences save a total of 156 million gallons of water annually. That's more than enough to fill Seattle's 76-floor Columbia Center tower.

"We're just measuring savings," says Adelstein. "That's not even saying that people in these homes conserve more water. That is just based on them having higher-performing fixtures."

He encourages builders and homeowners to outline goals and then take green steps that suit their budget. Using stained concrete floors in a basement, for example, can free up funds for efficient appliances or eco-friendly flooring.

"It takes a little shift of mindset on the cost side," says Lisa Petterson, director of sustainability resources at SERA Architects in Portland. Her firm provides sustainable design and master planning services for commercial and public projects, including mixed-use and multifamily housing developments. When Petterson analyzes construction options and costs, she factors in issues such as durability and health. Investing in non-toxic building materials or heating systems that minimize dust and mold may

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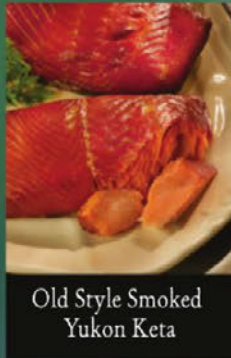
and **home energy monitors** is helping homeowners minimize energy use when they're asleep or away. Such tools identify usage patterns and allow consumers to program and remotely control heating and cooling systems via smartphone apps, tablets and personal computers.

These systems could someday expand to include window controls, as well. View Dynamic Glass developed **panes that electronically adjust** to exterior conditions, tinting automatically according to a programmed schedule or through a tap on a mobile app. While the company currently serves commercial clients, that could change as more builders are introduced to the product.

"There's nothing in the technology we apply to commercial buildings that would prevent us from applying it to residential buildings," says Brandon Tinianov, View's senior business development director.



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diminish the need for future medical visits and allergy treatments.

Quantifying the health impact of green homes is the holy grail of residential sustainability, according to Build It Green Deputy Executive Director Bruce Mast. His nonprofit promotes sustainable home projects across California.

"We know that green practices improve indoor air quality in the home. We know we're going to reduce the volatile organic compounds. We're going to have better ventilation and more fresh air, and we know that's going to have real benefits, particularly for people with asthma and respiratory stress. But, it's really hard to put a dollar value on that," he says. "A lot of work goes into how to better understand those things."

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"The focus is bottom-line benefits," says Mast. "How are we going to lower utility bills, make this home more comfortable, more durable and more healthful in a tangible way?"

Alaska's Cold Climate Housing Research Center (CCHRC) in Fairbanks uses green building strategies to address another climate-related challenge: cold temperatures. Many families struggle with expensive energy bills during the state's winters, explains CCHRC founder and CEO Jack Hébert.

"The average cost of energy in Fairbanks is a third of household income," he says. "In many regions of Alaska, we've been able to reduce energy use in a standard new home by 80 percent. If you have an \$8,000-a-year fuel bill to keep your family warm, an 80 percent reduction has a huge impact on your life."

Some Alaska communities face elevated rates of respiratory trouble because residents seal drafty homes with caulk, and then burn wood for affordable heat. That leads to moisture buildup and mold growth in older homes that lack proper ventilation, and the smoke contributes to outdoor air pollution, as well. Green retrofits on existing homes protect air quality while cutting household energy costs up to 50 percent.

"Think about your energy use. Think about how you live, how you get to and from work, what kinds of foods you eat. Then think about what kind of home you have and how you can lower your footprint within your daily life," Hébert says. "Human behavior is the most important part of a sustainable lifestyle."

Hébert says this holistic approach to sustainable building yields a more successful outcome than item-by-item design. After all, the aim of sustainability is both better lives and a better world. ▲

Renee Brincks is based in San Francisco.