Red
Cottage
Studios

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Red Cottage Studios Goes Greener

Which green building solutions are appropriate for your sustainability goals? Are they architecturally and financially feasible? We can help you decide.

Red Cottage Studios is the team of Lydia Marshall and Robert Drucker, Architects and Certified Sustainable Building Advisors.

Last year we did our own green retrofit. It was a lot of work, and it was emphatically worth it; we're more comfortable and our utility bills are much lower.

Here's the story:

We live and work in a 1929 two-story wood Tudor house in Ballard. We had a home energy audit which included a blower door test to measure how much our house was leaking. If you combine the leaks in an average house you'd have a three-foot diameter hole in the wall, but our house was worse than that! Our priority became reducing heat loss.

Step One: Air Sealing

We did some ourselves: We added weather stripping and door sweeps at the exterior doors and we sealed the attic access doors. We installed a Chimney Balloon to seal our fireplace when we're not using it. We even added plastic covers to the pulleys on our old double-hung windows!

We hired specialists for other tasks: Spray foam was used to seal penetrations of wiring and plumbing, and foam with rigid insulation sealed the basement rim joists. The exterior walls were filled with dense-pack blown-in cellulose insulation, which is also an air-sealer. We added insulation to our attic to achieve an R-value of 60.

While You're At It ...

We hadn't bolted our house to its foundation for earthquake safety. We wouldn't have access to drill holes in the foundation and install steel bolts after the walls were filled with insulation. Our green retrofit gave us the impetus to do the seismic upgrade now.

Blower Door Test for Air Leakage

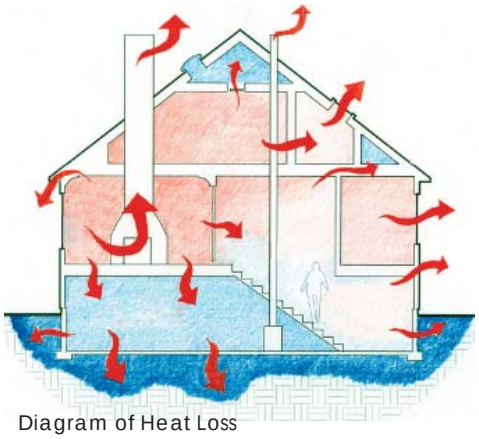
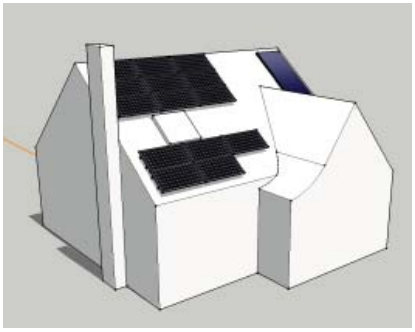


Diagram of Heat Loss

Nailing Plywood Shear Walls

Step Two: Reduce Energy Loads

We calculated our annual consumption of electricity and gas. It was over 25,600 kWh, about the Seattle average. Our lighting is already 90% compact florescent. We replaced our 70% efficiency gas furnace with a modulating furnace that is 97.5% efficient. It's smaller, much quieter, and maintains a steady temperature. We sealed all of the joints in our ducts to improve the distribution of heat.



Preliminary Layout of Solar Panels

Step Three: Change Habits

We remind ourselves to turn off lights, cook with lids on pots, and use the energy saving settings on our computers. We read that our clothes dryer uses about ten percent of our electricity, so we dry clothes on a clothes line. Reducing plug loads is our next challenge; home electronics can consume more energy than household appliances!

Step Four: Energy, Freely Given

We all share a super-efficient nuclear fusion reactor, safely 93 million miles away: the Sun! Having reduced our energy loads we chose to add a photovoltaic system and a solar thermal hot-water collector to our south-facing roof.

A & R Solar Installing Photovoltaics

While You're At It (Part II)...

Our roof was good for another seven years, but A&R Solar was reluctant to install a system that they would have to remove when we replaced the roof later. We replaced the south side of the roof now. We had the roofer and A&R meet to coordinate their systems.

Our 14-panel, 3.22kWh photovoltaic system provided 56% of our electricity last year. Our flat-plate thermal collector provided hot water for ten months of the year. We sold over $500 of electricity back to Seattle City Light, and the 30 percent Federal tax credit made filing our taxes an occasion for celebration! It's fun watching the meters display our production.

Seattle City Light Installing Production Meter - $550 earned in 2011 !

Step Five: Evaluate

Our project was about comfort, the planet, economics, and education. Just as we don't know when our car or our kitchen remodel will "pay for themselves", this green retrofit was not about simple pay-back. Our annual energy consumption has dropped to 12,845 kWh, our utility bills have gone down 54%, and the house is much more comfortable in all seasons.

We are integrating our new knowledge into our current remodel and new-construction projects. We learned a lot, we'd love to share more details, and we can advise you based on our ongoing experience. Give us a call !

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