

Green Remodeling

Tips for Minnesota Homeowners



Remodeling an existing home provides an opportunity to reduce home energy demands, reduce home maintenance costs, and increase comfort efficiently and cost-effectively.

By the same token, remodeling, like any building activity, can create waste and pollution. Fortunately, there are a number of steps that can be taken to minimize the ecological impacts and maximize the resource efficiency of remodeling projects, while also creating a healthier and more economical environment in which to live.

Following are resources and concepts for “greening” your home renovation efforts. Individuals with allergies and/or chemical sensitivities may want to seek additional or alternative expertise and information.

Inform your contractor (and other building professionals) early on that you want to renovate in an environmentally responsible manner.

For information on green building
contact MPCA's Green Building Specialists
Erin Barnes-Driscoll, or Laura Millberg
at 651-296-6300.



**Minnesota Pollution
Control Agency**

Guiding Principles

- **Plan ahead, plan early.** It's generally easier and less expensive to incorporate “green” materials and concepts during the early stages of project planning than to add them later in the process. Including green features upfront also lends itself more easily to an integrated design strategy, which considers a house as a “system.”
- **Consider a “no build” strategy.** Is additional space really needed? Or could current space be configured differently to meet your needs? Less construction results in less waste, pollution, and resource use.
- **Prioritize needs vs. wants.** Consider the condition of the home and its components (as well as your own budget). If it is an older house, structural upgrades or repairs may need to occur before other changes can (or should) be implemented. Involve someone with building science experience and knowledge early in the planning process to assess the condition of the house and make recommendations. Contact the Minnesota Building Performance Association for more information, www.mbpas.us/existinghomes.htm
- **Participate in Minnesota GreenStar Certified Homes & Remodeling,** a new, MPCA-funded program of the National Association of the Remodeling Industry—MN Chapter, the Builders Association of the Twin Cities, and the Green Institute. Program guidelines and information are now available at www.mngreenstar.org.
- **Be mindful of climatic differences.** A product that works great in a warm, arid climate may be totally inappropriate for Minnesota. Talk to your building professionals about products and systems that work for homes in the upper Midwest.
- **Seek out contractors and other building professionals who** know and understand “building science” and energy-efficiency as they relate to remodeling, and who are eager to apply “green” remodeling principles. Contact MN GreenStar for names of contractors who have completed program training.
- **A green home is only as green** as the materials and practices that are used to maintain it. Make a point of using nontoxic cleaners, low-VOC (volatile organic compound) finishes, and similar products; energy- and water-efficient practices and appliances; and environment-friendly lawn care/landscaping techniques.



Prioritizing and planning for green upgrades

No single aspect or product makes a house “green”—it is the interaction of multiple components and systems that ultimately results in an environmentally sustainable home. It is crucial, therefore, to approach the remodeling process from an operational and structural standpoint, first and foremost, before an aesthetic one. What good, after all, are new bamboo floors if your house is falling apart and the roof is leaking?

Greenbuildingadvisor.com lays out four crucial steps for approaching a home remodel. In order of importance, these include:

- 1. Get an energy audit.** An energy audit is a comprehensive analysis of a home’s energy use. It looks at air infiltration, insulation levels, function of heating/cooling systems, and opportunities for increasing energy efficiencies. A comprehensive audit typically includes such diagnostics as a blower-door test and a thermographic scan using an infrared camera. Results of an audit can help you lay out a strategy for making the upgrades or repairs that are the most pressing from a financial or health and safety standpoint. Audits can also lead to home improvements that lower the operational costs of homes, freeing up funds for use on other home improvement projects.
- 2. Draw up a plan.** Depending on the complexity of the remodeling project, it’s important to determine the scope and timing of the project, its costs and financial impacts, and a rational sequence for implementation.
- 3. Set priorities.** Again, the structural integrity of the house should come first, followed by energy consumption. Attend to the small but important things, like caulking and weather-stripping,

first, followed by air sealing and insulating. Big ticket items should only come (if at all) after attending to these initial items.

- 4. Dig in.** Make sure to have a plan for reducing, eliminating, reusing, and recycling the inevitable waste that will be generated from the remodel. It’s also vital to address ahead-of-time how irritants and toxins will be kept to a minimum or handled, including dust, lead-based paint, asbestos, etc.

Source: *Greenbuildingadvisor.com*

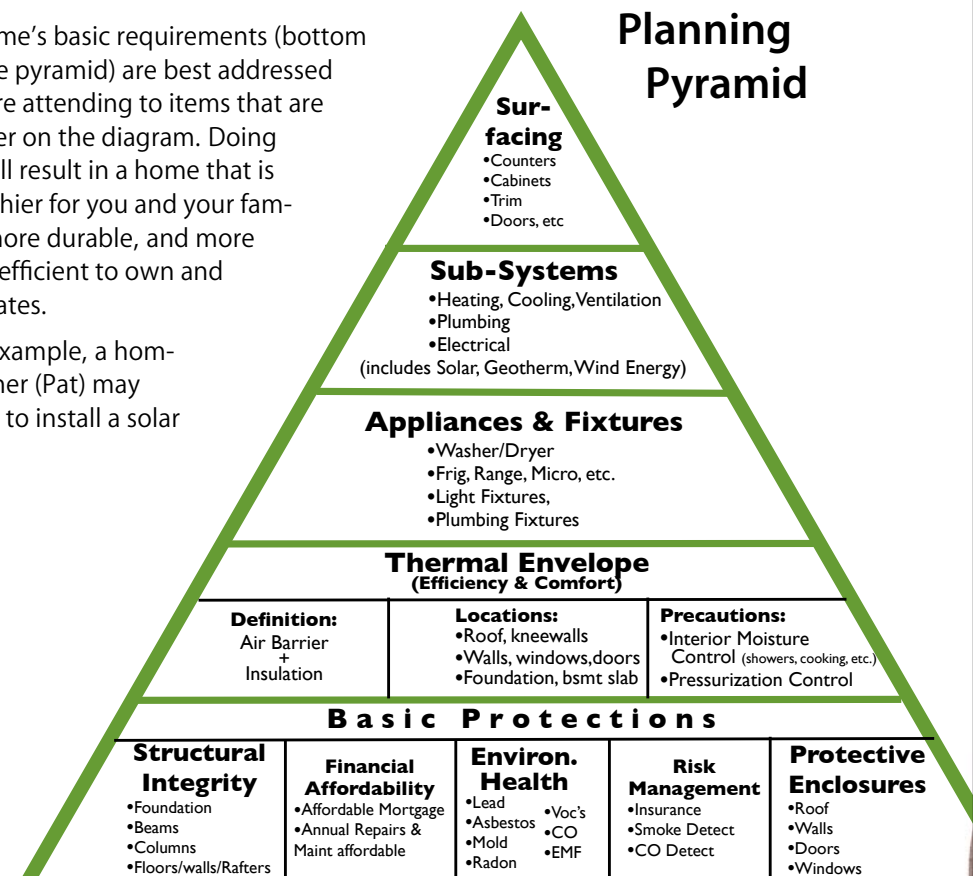
The “**Planning Pyramid**,” created by long-time Twin Cities green remodeler and remodeling “coach” Bob Alf, adeptly illustrates how to address priorities in a home remodel.

A home’s basic requirements (bottom of the pyramid) are best addressed before attending to items that are higher on the diagram. Doing so will result in a home that is healthier for you and your family, more durable, and more cost-efficient to own and operates.

For example, a homeowner (Pat) may want to install a solar

heating system on the roof (see layer Sub-Systems), but the pyramid encourages Pat to first consider lower levels of the pyramid such as Thermal Envelope. In this case, Pat would benefit greatly by first improving insulation and sealing air leaks so that the size of the solar heating system can be smaller. Since financial paybacks on insulation and air-sealing are generally much faster than solar systems, Pat will have more money for continued sustainable improvements. Plus, the smaller solar system costs less thus helping to pay for the insulation and air-sealing.

Planning Pyramid





Hiring professionals

Most of us take great care to choose physicians and other professionals who have the proper professional training and credentials. When it comes to our homes, the importance of hiring competent, knowledgeable professionals also holds true. This is particularly true in green remodeling, which involves equal parts building science, green systems and product knowledge, knowledge of and commitment to broader ecological concepts (the big picture), and strong carpentry and/or design abilities.

To improve the chances of the project being done correctly and to reduce the chances for unforeseen problems down the road, seek out building professionals with training and credentials in green building. Programs like Minnesota GreenStar (www.mngreenstar.org), the National Association of the Remodeling Industry, which has a "Green Certified Professional" designation (www.greenremodeling.org), and the U.S. Green Building Council (www.usgbc.org), as well as the National Association of Home Builders (www.nahbgreen.org/Education/greenprofessional.aspx) and the Green Advantage program (www.greenadvantage.org), are a few examples of existing green building/remodeling training programs for builders.

Specific training in "building science" and energy-efficiency principles and applications, such as that offered by EEBA (www.eeba.org/housethatwork), is also important for professionals to have in order to understand how components and systems in houses interact with each other, the occupants, and the natural elements (air, moisture, energy flows, etc.).

Be wary of contractors who view "green" as strictly or largely about product choices. There is no such thing as a product that, because of its attributes, will somehow transform your home into one that is "green." As explained above, green remodeling is a whole systems process, of which product choices are only one small component.

As with any remodeling project, it is always a good idea to ask for completed project examples and client references. More information on finding reputable contractors or designers can be found at www.nari.org/homeowners and www.bamn.org/homebuyers.cfm. Another great source is Hiring the Pros, a City of Chicago Green Homes publication: www.cityofchicago.org/webportal/COCWebPortal/COC_EDITORIAL/GreenRemodeling_HiringthePros_1.pdf

Making it affordable

Here are some suggestions for keeping more "green" in your wallet when remodeling green:

- **Consider long-term costs.** Many green-building products are cost-competitive with conventional ones. Others may cost more upfront but provide immediate, intermediate- or long-term energy, maintenance, durability, and/or health savings.
- **Approach your project in stages.** Emphasize projects that have a quicker return-on-investment first. A good resource is the ROI table at www.greenandsave.com/master_roi_table.html.
- **Take advantage of tax credits and other incentives.** New tax incentives at the federal level make it easier to invest in a number of green products and systems that increase energy efficiency. More information is available at www.energy.gov/taxbreaks.htm. Many utilities also offer rebates—for a state-wide list (along with state government incentives), visit www.dsireusa.org. Check with your city, as well, to see what loan opportunities might exist.
- **Look for sensible tradeoffs.** Look for opportunities to make practical cost-tradeoffs. For example, spending more on air sealing and insulation could be balanced by the need for a smaller furnace and/or air conditioner.
- **Attend to the "low hanging fruit."** Replacing incandescent light-bulbs with compact fluorescents, having yearly furnace and A/C tune-ups (and replacing filters monthly), installing aerators on water faucets and low-flow showerheads are some of the myriad low-cost energy and water efficiency things that you can do to reduce utility

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costs while conserving resources. In turn, use the money you save from such steps to fund higher-cost changes.

- **Do your research upfront.** Familiarizing yourself with products, systems, and approaches can help to make your project go more smoothly and cost-efficiently.
- **Hire experienced contractors.** You'll avoid paying extra for your contractor's green learning curve if you hire building professionals who already understand and have experience in green remodeling.

More ideas for saving money via green remodeling can be found in *Green Remodeling: Changing the World One Room at a Time*, by David Johnston and Kim Master, New Society Publishers, 2004.



Solar electricity is becoming increasingly affordable. For information on installing your own photovoltaic system, and on rebates you may qualify for, visit solarminnesota.org.

Resources

Addressing Indoor Environmental Concerns During Remodeling.

U.S. Environmental Protection Agency. Sensible advice on avoiding or minimizing the generation of pollutants during remodeling.

www.epa.gov/iaq/homes/hip-concerns.html

A Consumer's Guide to Energy Efficiency and Renewable Energy.

Comprehensive information on renewable energy options and energy-efficiency for homeowners and small business. *U.S. Department of Energy (DOE), Energy Efficiency and Renewable Energy.*

www.eere.energy.gov/consumer

Efficient Windows Collaborative. Site contains printable fact sheets and a wealth of other information relating to windows, including benefits of particular window types, descriptions of how they work, and recommendations for their selection and use.

www.efficientwindows.org

Energy-Star Home Improvement Guide. Web-based resource identifies common energy problems, as well as solutions for remedying them.

www.energystar.gov

Energy Efficient Rehab Advisor. Interactive tool from the U.S. Department of Housing and Urban Development provides guidelines for conducting energy-efficient housing rehabilitation.

www.rehabadvisor.pathnet.org

GREENGUARD Indoor Air Quality Certified® Product certification program for low emitting interior building materials, furnishings, and finish systems. All products that receive the GREENGUARD certification have been tested for their chemical emissions performance.

www.greenguard.org

Minnesota Department of Commerce Energy Information Center.

Consumer-oriented site contains detailed, printable guides on a variety of home energy topics, as well as information on renewable energy and emerging technologies.

www.energy.mn.gov

Minnesota Pollution Control Agency. Green Building web site.

Residential section has a number of relevant and valuable materials and links relating to green building, both for consumers and builders.

www.pca.state.mn.us/greenbuilding

Read This Before You Design, Build, Or Renovate. Updated version of 2001 building science primer. Provides guidance on remodeling and building practices that lead to reduced homeowner exposure to known health hazards while improving durability and reducing operating costs.

www.buildingscience.com/doctypes/primer/

REGREEN Residential Remodeling Guidelines. A joint effort of the American Society of Interior Designers (ASID) and the US Green Building Council (USGBC), these user-friendly guidelines present best-green-practices for a variety of remodeling projects.

www.regreenprogram.org