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Earth Day's
Ten Ways to a "Green" Home Remodel

Simple Reasons to Remodel Sustainably

- Improve quality of life
- Ease of maintenance
- Thermal and physical comfort
- Indoor environmental quality
- Long-term durability
- Save resources
- Conserve water
- Preserve environment
- Reduce operating costs and increase home's value
- Aesthetics
- Upgrade appliances and fixtures, storage areas, finishes
- Improve circulation and expand spaces
- Improve quality of life
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Issues to Address

- Current electric bills/usage
- Energy audit to find heat losses
- Payback on investments
- Comfort provided?
- How long will you live in the home?

Project Types

- Weatherization
- Down-to-the-studs
- Major additions
- Kitchens
- Bathrooms
- Living/working spaces
- Bedrooms
- Finished basement
- Outdoor living areas
- Bits and pieces here and there

Before Designing a Remodel

- Energy audit – i.e. do envelope and ducting system leak air/heat?

- More space or better use of existing?
- Mechanical systems – lighting, plumbing, HVAC, wiring
- Interior spaces – do they work? i.e. entrances – is there *room* for shoe storage, walk-off mats and closing off space?
- Identify materials containing allergens or toxins and identify materials for re-use value
- Building/site interaction – light, water, soil, wind
- Consider neighborhood – what fits in?

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1 - Energy audit first – doing a complete energy retrofit can yield a 50% reduction in energy use – but you need a roadmap to get there…

a. They will test air leaks with blower door test, duct blast, pressure pan for ducts… infrared scan of envelope

2 - **Water heater** –

- Insulating your water heater can provide 10% savings in energy use
- Lower the temperature to 120 degrees or a 10% energy savings
- 32% ROI (about $4 per month)

3 - **Improve the envelope** – "weatherize"

Cold air flows *in* through leaks around windows, doors, can lights, vents, openings
Heat flows *out* through poorly insulated attics floor joists

- Seal cracks – 25% reduction in energy use
- Seal duct leaks – these can account for 15-30% of your heating and cooling costs
- Clean ducts
- Tune-up system
- Heat recovery ventilator
- Programmable thermostat
- Whole house fan
- Insulation - Add to the R-value – 20-50% energy savings
  - adding the insulation, caulking and lights might run an average homeowner $5,000 to $7,000 and could save about 30% on your energy bills – plus, check rebates. Options include closed cell foam, recycled paper, hemp, and recycled denim
- Windows – replace old single-pane with Energy Star rated – 15% energy savings with new ones

4 - Reduce your **thermostat** temperature and put on a sweater

- Programmable thermostat pays for itself in one year

5 - Efficient **HVAC** and l**ighting**: EnergyStar-rated HVAC systems.

- If you have an 80% efficient gas furnace, by replacing it with a 97 percent efficient system, you'd cut your heating bills around 20 percent.
- Heat pump can yield energy savings in excess of 30%
- Ventilation: improved ventilation can address the problems of pollutants, toxins, allergens, and mold. A good air purification system works by air exchange, replacing old air with fresh, filtered air, controlling moisture, and removing harmful contaminants.
- Lighting –
    - lighting is 10% of energy bills in most home –
    - turn lights off when not in use –
    - CFLs can yield a 66% energy savings

6 – **Indoor air** – Walk-off areas at entrances – 60% of household "stuff" dust, etc comes from tracked-in soil and airborne particles. Create an area to leave shoes at doors and walk-off rugs or mats

- Central vac systems with HEPA filters
- Get rid of wall-to-wall carpet and use area rugs that can be removed and cleaned (wall to wall carpet is often three times heavier when it is removed than when installed, according to EPA
- Use no-VOC products for paint, cabinets, flooring finishes, etc.

7 - **Recycling**:

- waste recovery (recycling) instead of waste disposal (dumping into a landfill)
- US building-related construction and demolition (C&D) debris, 40 percent is from renovation and remodeling projects, while the rest is from demolition removal and new construction.
- Appliances, masonry materials, doors, and windows are all recyclable.

8 - Consider all **materials** – Local, renewable, recyclable, salvagable

- EcoHaus, Home Depot EcoOptions, Dunn Lumber
- Check out local second-hand stores: ReStore and Second Use Building Materials – online see **ReUse Consulting** that maintains a database of materials, and **King County's Online Exchange** and the national **Recycle.net**

9 - **Low-flow Products**: Water is one of the scarcest resources worldwide.

- For faucets, toilets, and showerheads, low-flow water-saving options.
- Sink aerators add pressure so less water is needed.
- Toilets with dual flushing and assisted flushing.
- Tankless or solar heated water heater.
- Dishwasher – new ones have 25% energy savings plus 800 gallons per year water savings
- Clothes washer – new Energy Star use 50% less energy

10 – **Landscaping** – go organic!

- In the US, pesticides poison 110,000 people each year -- More than one-third of calls to animal poison control centers result from pets exposed to pesticides
- The volatile organic compounds (including pesticides) found indoors are believed to cause 3,000 cases of cancer a year in the US
- According to the New York State Attorney General's office, 95 percent of the pesticides used on residential lawns are considered probable carcinogens by the EPA
- 2,4-D—a component of Agent Orange—is used in about 1,500 lawn care products

    - Deciduous trees for shade in summer, let sun through in winter
    - Proper orientation of house on site
    - Keep sun off glazing first
    - Use solar-powered lighting
    - Collect rainwater and gravity-feed to landscape

11 – **Renewable Energy** – higher cost with longer payback

- Wind – need height and space for most systems
- Solar – south-facing, can net meter with utility
- Geothermal – radiant floor and baseboard radiators, need large ducts, costs 2-3X conventional

12 - **Green Credentials**: look for remodelers, builders, contractors, real estate agents, designers who are educated about green building practices

- Builders: NAHB certified green professional
- Anyone: LEED AP, Green Advantage professional
- Realtors: NAR green designation

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Top Ten Commercial Green Renovations

- **Fluid applied roofing** over existing roofing to extend its life, increase reflectivity and reduce cooling loads.
- **Solar-Control Window Films** filter out the sun's heat without blocking visible light.
- **Entryway Track-Off Systems** extend the life of flooring and help with good indoor air quality.
- **Low-Flow Showerheads** save up to 6.4 gallons of water per minute in older shower facilities.
- **Dual-Flush Flushometer Valves** cut water usage and utility savings associated with toilet flushing.
- **Duct Sealants** stop heat loss in the HVAC system.
- **Condensing Boilers** are high-efficiency boiler replacements.
- **Lighting and Plug Load Occupancy Sensors** reduce lighting energy use.
- **Energy Dashboards** are great energy-saving devices.
- **LED Signs and Lighting** reduce energy consumption.

Source: Environmental Building News