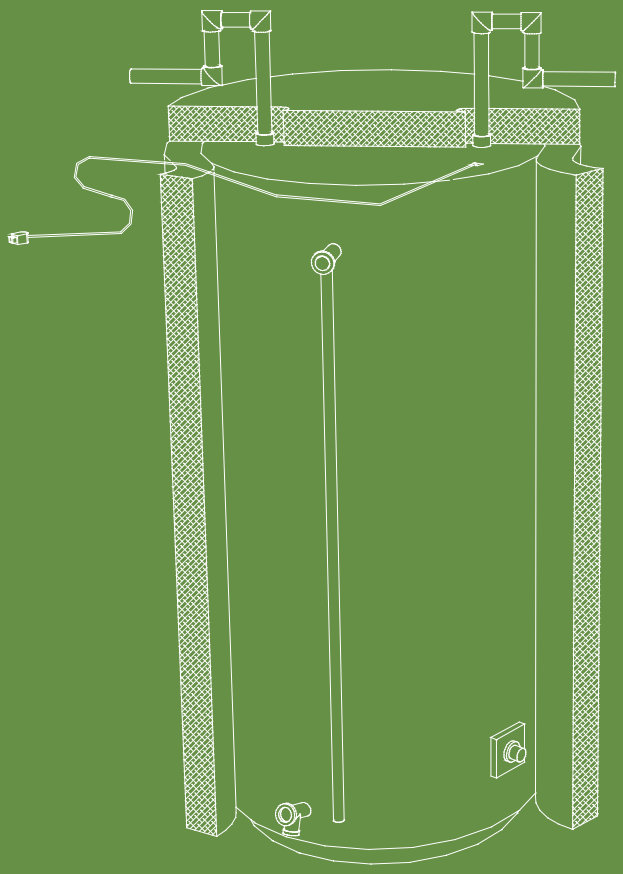
Green From The Start

The start of every remodeling project—whether a single room renovation or whole-house gut-rehab—takes comprehensive project planning with the major players involved in the remodeling process.

No less important for the green remodeling project, comprehensive green project planning follows these steps:

- **Client Interview**
- **Building Assessment**
- **Systems-Integrated Team Building**
- **Cost-Benefit Analysis**
- **Code and Zoning Issues Management**



Client Interview

It is important to begin every project with a "guided discovery" process with the client, asking both open-ended and pointed questions to determine their reasons for renovating in the first place. This process gives the client opportunities to express desires, issues, and concerns, and to develop goals, ensuing strategies, and budgets that are aligned with these desires, needs, and expectations. This important up-front process also allows for the design and building professionals to identify issues of which the owners may not be aware.

Some representative questions for this client interview include:

- What precipitated the desire for a remodel?
- What do they like about the house?
- What things about the house no longer work for their needs or lifestyle?
- What results do they expect from their renovation?
- Is their house moldy, dusty, dry, or damp?
- How long are they planning to live in the house?
- What compromises have they made due to existing problematic conditions?
- Are health issues driving their remodeling project?
- What are their attitudes towards the operations, maintenance, and cleaning of their home?
- Are they happy with the quality of finishes, and furnishings, and what are they looking to keep and upgrade?
- Is increased water efficiency a goal?
- Does the house provide them with the desired amount of daylight and sunshine?
- Do their utility bills seem very high?
- Are there hot or cold spots in their house?
- Do they have to wait a long time for hot water to reach certain fixtures?
- What thermostat setting do they use in the summer and winter?

This guided discovery process provides another opportunity—setting expectations and identifying cause-and-effect outcomes. Energy retrofits can improve both energy performance and thermal comfort, but sometimes increased comfort comes at the price of reduced overall energy improvement. If exhaust fans are required to ensure a healthy, comfortable interior, for example, homeowners need to be aware of the energy costs of those fans. It's important that the clients know just what they must do to maximize the benefit of the green investment they will make in the project.

Building Assessment

The foundation of green remodeling is performance-based systems integration: understanding and then capturing how the structure, finish, furnishings, and mechanical systems work together to make a home safe, healthy, efficient, and durable over time. The six key elements to assess and honor or improve are:

- Building/Site Interfaces
- Home Performance
- Mechanical Systems
- Interior Spaces
- Materials
- Hazards

Building/Site Interfaces – The way that sunlight, water, and wind move across or off of the home's shell can augment or challenge home performance and levels of comfort. Surface water and groundwater movement can be assessed for proper drainage; trees and adjacent structures can be assessed for desired shading or solar access potential and natural ventilation strategies. Site conditions should also be placed in the larger context of climate, with recommendations for both building envelope and HVAC solutions honoring both opportunities and constraints that climate conditions bring to the project.

Home Performance – Assessment of the building envelope and mechanical systems are the two major elements of a home performance audit.

The building envelope components that manage water, air, and heat must be continuous and complete. Many existing homes have gaps or a complete lack of one or more of these barrier systems.

A combination of visual inspections and testing (blower door, infra-red technology, moisture meters) can help identify deficiencies in the water, air, and thermal barrier systems, providing you with the information you need to repair, relocate, or create continuous protection systems.

We try to keep our building envelopes from getting wet and we try to help them dry if—or more likely when—they do get wet. Vapor profiles of building assemblies are simply assessments of the water/air/vapor permeability of each and all of a wall's or roof's components and making sure that these properties permit or encourage drying of the assemblies to the outside, inside, or both. It's often not necessary for this assessment to be quantitative; knowing the relative permeability of assembly components is often enough to gauge drying potential.

There are building assessment tools that green remodeling professionals can use. The LEED for Homes Durability Evaluation Form (from Credit 2 in the Innovation and Design Process section) is one example and the Building Profile Worksheet listed in this Guide's appendices is another.

Mechanical Systems – These include heating, air conditioning, fresh air ventilation, plumbing, and electrical wiring and equipment. Forced-air HVAC systems can be tested using a duct blaster to identify duct defects. Furnaces, boilers, and gas water heaters can be inspected and tested for combustion safety. Hot water pipes can be identified and tested to determine how long it takes for water to reach fixtures. Finally, wiring, switching, lighting, and other equipment can be assessed for potential improvements such as lamp or fixture replacement.

Interior Space, Furnishings, and Equipment – In tandem with the assessment of the building structure itself is the determination of how well the layout of the existing spaces within the home is working. Current use of space, re-organization of space, and ease of navigation through the home are all a part of this assessment. The placement of furniture and equipment establish patterns of movement that should support the activities, health and safety of the home occupants, and not interfere with goals such as improved efficiency, comfort, air quality, and noise acoustics.

Every existing home also comes with a substantial inventory of furniture, equipment, and hundreds of furnishing and accessory items—flooring, lighting, window treatments, and artwork to name a few. Assessment and inventory of these existing goods must be done to ensure that the new proposed floor plan maximizes the space and traffic flow relationships throughout the house and balances replacement and refurbishing.

Materials – There are two sides to this assessment: evaluating materials that should NOT become waste because of their reuse potential and evaluating materials that are not only waste, but hazards.

Selective or complete dismantling of a home are demolition methods called "deconstruction," which uses skilled labor as an alternative to the wrecking ball. It can preserve for reuse everything from floor joists to the kitchen sink, from the front door to the light fixtures. Every brick, stick of lumber, or salvaged architectural detail removed from the waste stream saves valuable landfill space, conserves production energy, and can potentially add beauty and historical value to the renovation of the home.

Hazards – These can be mold, water leaks, poor indoor air quality, lead-based paint, radon, asbestos, and structural defects. Some can be assessed by straight visual inspection; others require testing. All are important to the health of the building, the occupants, and the remodeling project.

Integrated Team Building

One of the most important aspects of green remodeling is assembling a project team that understands the importance of systems integration and how their jobs might be a little different because of this approach.

For example, designers must work with the builder to integrate mechanical systems with the structure, keeping ducts and equipment within conditioned space. The project manager (head carpenter) may need to work out some sequencing details with the insulation contractor to ensure that the air and thermal barriers are complete and continuous, especially at challenging locations, such as behind the tub on an outside wall. The painting contractor needs to understand that substituting a different quality of caulk or paint is not acceptable because of the impact on indoor air quality or the moisture performance of the exterior wall assembly. This type of coordination or systems integration almost always requires three things:

- A team leader who keeps the clients' goals and big picture in mind and who, on his/her own or working with the client, assembles a project team capable of systems-thinking.
- High-quality floor plans, drawings, specifications, and contractor scopes that fully support the project goals.
- Training, whether it is obtained through a trade association's green certification process or simply by having team members work their way through the REGREEN Guidelines.

Green remodeling expertise, including systems integration, can reside in a single person or be spread throughout the team. Not every project team will require a green remodeling consultant, but the benefits of including such expertise may quickly exceed the costs.

Cost-Benefit Analysis

Cost-benefit analysis is an important part of the "guided discovery" process that takes place with the client. Green remodeling professionals have a special opportunity to show how systems integration can actually improve cost-benefit outcomes and provide greater overall value, particularly in the long term. Examples include:

- Deeper improvements to the thermal performance of the building envelope can result in downsizing or even eliminating HVAC components, generating a breakeven or even an improved cost-benefit ratio on these elements of the remodel.
- The building and interiors assessment and guided discovery in the client interview shifts the remodeling project from a major addition to (primarily) a reconfiguration of existing space.
- The building and interiors assessment and guided discovery shift the project from an inappropriate gut rehab on a failing structure, to the overall more valuable deconstruction and complete re-building of the home.

Green remodeling clients are very likely already attuned to a discussion of cost-benefit that includes an expanded definition of value. But using the systems-integration approach to augment the discussion of cost-benefit can move the discussion from, "I have heard that building green costs a lot more" to, "It's great that building green delivers so much more value."

Codes and Zoning Issues Management

Certain green building features and lifestyle choices can be limited or restricted by municipal codes or neighborhood covenants. Some neighborhoods forbid clotheslines as an undesirable look, for example, preventing homeowners from implementing one of the simplest ways to save energy. Approval to install solar panels may be difficult in some areas, particularly historic districts. While the building code may allow advanced framing techniques, the local building inspector may feel otherwise. Green remodeling professionals must be proactive during the planning phase of a project and not reactive during the construction phase when features of the project involve code and zoning issues.

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The benefits of using the Green From The Start approach in large remodeling projects are probably pretty clear at this point. What many professionals may fail to realize is that every remodeling project will benefit from this approach, and not doing so can be risky in even the smallest projects. Consider these examples:

- **Interior Finishes:** What a designer specifies can have an effect on the performance of the building assembly, the indoor air quality, and health of the family. For example, if a designer specifies an impermeable wall covering in a hot-humid climate, moisture condensing on the back of the wall covering could result in mold growth on the paper facings of the gypsum board and even rot if the wall is a wood-framed assembly.

- **Window replacement:** As the existing window unit is pulled from the wall, it is discovered that the wall has no building paper or housewrap; there will be no way to weatherlap the flashing of the new window unit to the old assembly. If a building assessment had been accomplished during comprehensive planning, the client and remodeling professional may have worked out a more satisfactory result, such as combining the window replacement with some level of re-cladding.

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Comprehensive project planning is critical to green remodeling and interior design; it can mean a green start that leads to a green finish.

Projects

The ten project types in the next section of this Guide contain project-specific planning issues. But before moving on to the ten green remodeling projects in the Guidelines, keep these things in mind:

- **Green your projects and your business in steps. Make every project better than the last, but don't try to do everything at once. It can be like trying to drink from a fire hose—you will drown before you slake your thirst.**
- **Get professional assistance when you need it. You may need quite a bit of help when you are starting, less and less as you get more experience. Sources for this guidance include local green building and remodeling programs, non-profit, energy efficiency organizations, independent consultants, and experienced green remodelers and design professionals who can serve as mentors.**
- **Training is critical. Attend green building and remodeling classes before you start your first project and attend classes and conferences whenever you can. And don't forget to train your staff, your trade contractors, and even your vendors to assure that you get the consistently high performance needed to make your projects green.**