

## **Guiding Principles: Staged Approach to Deep Reductions**

- 1) Start with the end in mind, and examine the steps that will be on the path to that goal. Plan ahead to avoid creating barriers for future phases.
- 2) Make a value proposition. Embrace non-energy impacts: in many cases, the value of non-energy impacts outweighs the energy related impact.
- 3) Do no harm. Recognizing pre-existing hazards is more critical in a staged project than an “All at Once” because hazards may not be addressed fully until a later stage. During an “All at Once” implementation, hazards can be addressed by design (eliminate atmospheric vented appliance, add mechanical ventilation, etc.).
- 4) The house is a system. Recognize the potential for well-intended actions to yield unanticipated side effects.
- 5) Consider creative approaches such as equipment leases for transitional equipment or components installed with a plan for reuse.
- 6) Avoid suboptimal investment and rework. Do each step, and do it right and comprehensively the first time. The decisions made regarding a home’s structure usually last longer than mechanical systems, appliances, or renewables. Marc Rosenbaum suggests a simple maxim, “Invest as much as you can afford to reduce the load, even if it means completing a project in phases.”
- 7) Consider clusters of work by trade in order to reduce transaction costs (e.g., install wiring needed for anticipated actions so that an electrician’s services (and permits) are needed only once.
- 8) Make sure that the systems installed will work well over the range of conditions and loads that the home and household will see now and in the future. For example, a ductless heat pump, some combi systems, or a point heat source may provide more flexibility over a larger range of operating conditions, and could work more effectively and efficiently as the loads are reduced.