

Suggestions for Sustainable Energy-Efficient Buildings 4/2016

*Share this with your architect, designer and builder. *Check for local building codes in your city, state and county.*

Building with Passive Solar Principles

- ___ Locate the building on the land to optimize access to solar resources.
- ___ Design roof overhangs and window heights to shade windows in summer & allows light in for the winter.
- ___ South facing windows have at least 80% access to direct winter sunlight.
- ___ Size of non-south facing windows minimized or effective window insulation added.
- ___ Exterior doors should be sheltered by the garage, a storm door, or air lock.
- ___ Floors: build on slab, rather than over crawl space, and insulated.
- ___ Site windows to access prevailing summer winds for evening cooling.
- ___ Keep natives or plant deciduous trees provided they don't shade solar panels.
- ___ Keep and protect existing native plants during construction.

Tighten up the Building Envelope - includes Roof, Walls, Doors & Windows

- ___ Get a blower door test to quantify infiltration and find leaks.
(Homes loose more heat from infiltration than from insulation.)
- ___ All insulation R-values meet or exceed code requirements.
- ___ Choose tight-fitting windows, such as fixed-pane, casement, or awning styles.
- ___ Consider the solar heat gain coefficient (SHGC) of the windows.
- ___ Window glazing U-values should be less than 0.3
- ___ Glass area that exceeds 5 percent of living space floor area should be coupled to a heat storage mass such as a concrete floor.

Water

- ___ Most effective hot-water heaters are hybrid (heat-pump) water heaters.
- ___ Plan for stormwater runoff to soak into existing landscape as much as possible.
- ___ Water catchment for supplementing drought-prone weather patterns.
- ___ Xeroscaping (landscaping that minimizes water) and choose native plants.

Space Heating and Cooling

- ___ Use an electric heat pump to increase heating/cooling efficiency.
(Note: Air-source heat pumps are nearly as efficient as ground-source heat pumps and can be less expensive to install.)
- ___ Use heat-recovery ventilators for efficient fresh air exchanges in the building.

Columbia Gorge Climate Action Network



www.cgcan.org

Working to create a healthy sustainable future for Columbia River Gorge residents.

Connect to Clean Electricity

- Buy renewable energy from your local utility. Most utilities have this option.
- Generate your own power by installing solar panels (PV) on the roof or property .
- Buy into a community solar project if available if on-site solar not practical.
- To make the building solar-ready, such as waiting for future PV, do the following:
 - 1) Position roof so it is oriented to optimize the solar resource.
 - 2) Consider a standing-seam metal roof (lasts for 50 years), or design the roof for ease of mounting PV panels.
 - 3) Assess ground-mounted PV if roof access is not reasonable.
 - 4) Photovoltaic (PV) space on the roof should be large to power the expected house loads PLUS about 4 kilowatts per electric vehicle (EV), for example, approximately 600 sq. feet for an efficient envelope and 2 EVs.
 - 5) Install conduits from solar area to the electrical load center of the home
- Reserve adequate space near the load center for inverters & battery storage

Other Electrical Loads

- Lighting should be 100% LED - inside and outside the home
- Choose energy-efficient appliances
- Induction cooktops are as fast as gas cooktops, and far easier to clean.

Transportation:

- Create easy access for bicycle storage
- Consider purchasing an electric bike
- Provide at least one 220-volt outlet for EV charging in a garage, with at least one 30-amp circuit; preferably one 50-amp service for each stall. Soon EVs will be the lowest cost of ownership for cars and light trucks with a 250-mile range!

WHY MIGHT YOU WANT TO PAY ATTENTION TO THESE GUIDELINES?

1. Smart consumers know renewable energy SAVES money! \$\$ in YOUR pocket!
2. Energy efficient features increase the resale value of your home.
3. Rebates and Incentives may be available (but are likely to vary from year to year)
4. Consumers have a choice in their long-term savings based on how they finance clean energy projects—finance it yourself or share the savings with a finance company or an energy vendor.
5. Clean energy helps to cut health care costs in your community (50,000 Americans die prematurely due to fossil fuel pollution)
6. Planning for the cost trajectories of clean-energy products future-proofs your house.

Additional Building and Remodeling Resources:

Technical and financial help for residences from ETO: <http://energytrust.org/residential/>
Efficiency info from Pacific Power: <https://www.pacificpower.net/res/sem/eeti.html>
Project and financing help through Enhabit: <https://enhabit.org/#A>
Emissions information: cgcan.org/resources/fix-your-footprint