Solar Energy

Passive solar systems use south-facing windows and thermal mass to collect and store solar heat. Active solar heating systems use pumps or fans to actively move heat. Solar-electric generating systems convert sunlight to electrical energy that can be stored in batteries and used for lighting and appliances.

Solar panels can be used in a stand-alone electrical power system or in combination with utility power. A benefit to combined systems is that you do not need battery storage, or if you want some electricity during a power outage, you need only a small battery bank. Also, every kilowatt your solar system generates offsets one you would buy. (To interconnect with utility power, you must have a qualifying inverter and sign a Net Metering Agreement.) As a rule of thumb, if your house is over three-quarters of a mile from power, it is cost effective to use solar electricity instead of utility power.

Several homes in the Methow have successfully used solar water-heating panels; over time they can significantly reduce your utility bill.

PLACING WINDOWS WISELY

South-facing windows under sufficient roof overhangs collect low-angle winter warmth and shade high-angle summer rays – they are ideal for passive solar gain. To avoid overheating in the summer and fall you can minimize, shade or tint west-facing windows. North-facing windows present a major source of heat loss, with little or no potential for solar gain.

Geothermal Heating and Cooling

Geothermal heat pumps are highly efficient systems for both heating and cooling. These systems circulate a liquid through tubes underground or underwater to take advantage of the enormous thermal potential of the earth. Various types of systems exist; all use a compressor (similar to the one in a refrigerator) and a heat exchanger. Many of these systems can also provide your household hot water. Geothermal systems cost more to install than other systems, but over time they pay for themselves in fuel savings.

LOG ON TO BUILT GREEN'S WEBSITE

BUILT GREEN Washington is a cooperative of the state of Washington's regional green-home building programs. By reducing the environmental impact of home construction, builders can create homes that operate much more efficiently, in addition to saving energy, water, resources – and money, too.

The BUILT GREEN website (www.builtgreenwashington.org) provides a checklist that offers builders a menu of green building strategies. It also contains numerous links to energy conservation incentive programs, building-materials exchange websites and indoor air-quality resources.

A Building for All Seasons

Properly insulating your home will allow you to stay warm in the winter and help keep the valley's hot summer temperatures outside without having to resort to costly air conditioning. A well-constructed home has well-sealed insulation, good quality windows and fresh air circulation.

Local electric utility companies offer a variety of energy-saving information and programs for new construction and renovations. The time to seek energy-efficiency consulting is during the design phase of your new home, before plans are ready to be submitted for a building permit.

Insulation

Heat (energy) flows toward cooler areas, and insulation is rated by how well it resists heat flow. R-value is a measure of resistance to heat flow. The higher the R-value, the more effective the insulation.

U-Value is used to rate the efficiency of windows and doors. The U-value of a window is measured by the number of BTUs that pass through each square foot of area per degree of temperature difference from one side of the window to the other. The lower the U-Value, the more efficient the window or door.

The Washington State energy code sets minimum R-values for all homes, and these vary by climate zone and type of heat used. To get a building permit you must follow these minimums. The more insulation you use above state minimums, the easier it will be to maintain a comfortable home temperature and conserve energy.

RECOMMENDED INSULATION FOR THE METHOW VALLEY

Attic	R-49-60
Cathedral	R-38-60
Wall	R-24-30
Floor	R-30
Slab edge	R-10-15
Doors	<U-0.20
Windows	<U-0.30

Vapor and Air-Flow Barriers

Air-flow barriers block air movement, stop drafts and fill gaps that can lead to leaks. Some materials that block air flow, such as house-wrap, sheetrock and the spaces between plywood sheathing sections, are permeable to vapor. Without a vapor barrier, warm indoor air moves into your walls and condenses on the colder surfaces, leading to dry rot and mold.

Vapor diffusion barriers stop moisture from moving into your walls and attic. Vapor barriers include rubber membranes, polyethylene wraps, glass, some oil-based paints, perm-rated primer paints and foil-faced insulation sheathings. These are typically recommended for use on outside walls, under the interior wall coverings and on the upper side of attic floors.

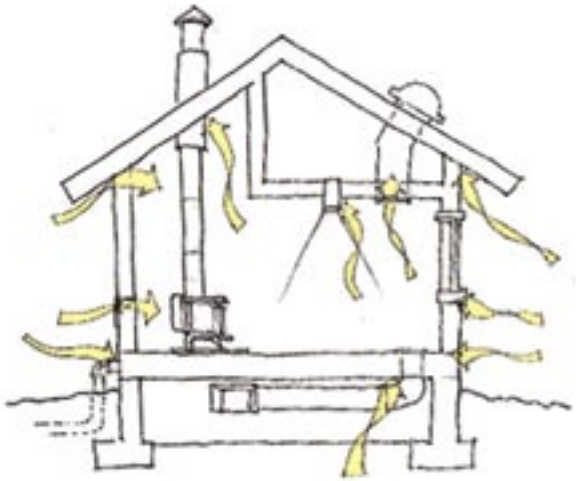
In addition to adding insulation that blocks heat loss along studs, rigid insulation on the outside of your home reduces vapor condensation inside your walls. Owners should ask their contractor to be attentive to the continuity of the barrier and to fix punctures made by subcontractors.

Ventilation
To keep indoor air clean, good insulation and sealing should be coupled with fresh air circulation. Building codes require a whole-house ventilation system. Simply opening windows does not ensure adequate ventilation.

The size of fan you are required to install depends on the number of bedrooms; a control timer allows you to decide when to ventilate. Eight hours of fresh-air ventilation per day is recommended. It is especially important to ventilate new homes to remove the inevitable toxins from new carpets and many construction materials.

An air-exchange ventilation system is an efficient way to ventilate your home while also reducing energy costs. In the winter it uses heated exhaust air to warm incoming cold air; in the summer it cools the warm, fresh, incoming air.

Leak-Prone Areas
The areas shown below need extra sealant or caulk to direct air circulation, reduce rodent and insect problems and reduce drafts and heat loss.



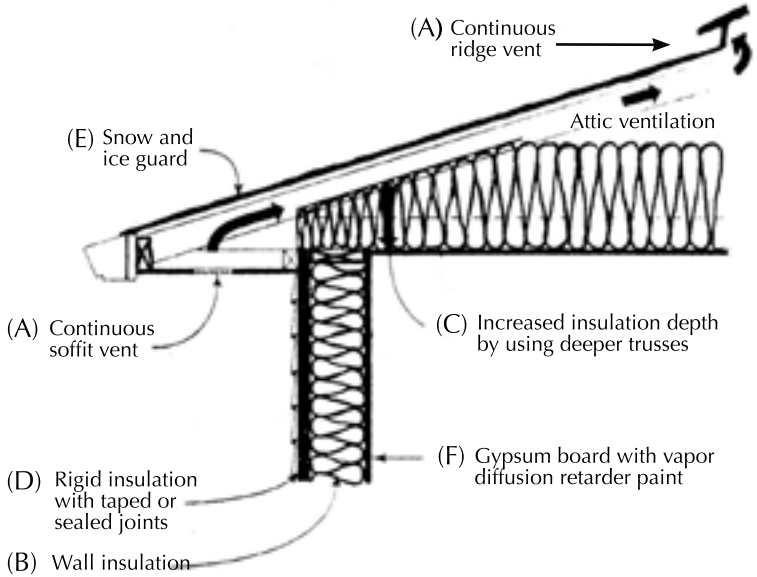


Diagram adapted from the *Cold Climate Builder's Guide*

The diagram above illustrates part of a building envelope in which air circulation, sealants and adequate insulation work together to maintain a comfortable temperature and prevent leaks. Note these details:

(A) Unobstructed air flow from the soffit vent to the ridge vent
(B) Dense insulation in the exterior wall
(C) Deep roof trusses for additional insulation
(D) Rigid insulation on the outside wall, with sealed joints
(E) Snow and ice guard (a sticky, sheet-like asphalt product) used along the lower edge of the roof to protect the roof sheathing from ice damage
(F) Vapor barriers to prevent condensation inside walls

Living with Snow

Snow provides residents and visitors alike with recreational opportunities such as cross country skiing, snowshoeing and downhill skiing. Snow that falls in November may not melt until April. This accumulated snow poses significant challenges for builders, architects and homeowners. In the winter of 1996-97 many barns and some roofs in the Methow collapsed because they were not adequately engineered for holding or shedding snow.

Shedding and Nonshedding Roofs

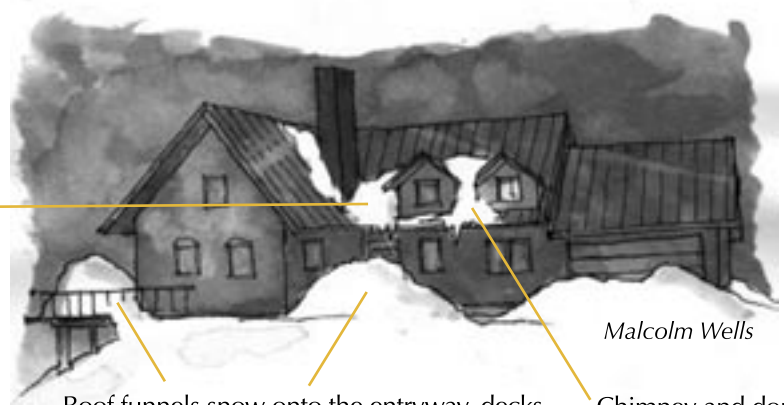
A metal roof sheds snow and also reduces fire danger. Snow slides off a moderately to steeply pitched metal roof and can be funneled away from entryways, stairs and open porches if these features are located at the gable ends and under covered porches.

Some roofs are designed to hold snow to take advantage of snow's insulating properties. These roofs are engineered to hold the extra weight of snow and usually have a shallow pitch or a textured surface such as composite material. They also have enough insulation to avoid melt-freeze cycles that quickly damage roofing materials.

Proper Roof Insulation

As a general rule, a simple, well-insulated roof performs well under snow. When a ceiling is poorly insulated and the roof is not vented, the bottom layer of snow on the roof melts and refreezes, creating layers of ice. These layers create dams that pool water on a roof and lead to damage and leaks. By adequately insulating your ceiling and venting under the roof eaves and at the ridgeline, you can help ensure that air will flow under your roof and keep it at a more uniform cold temperature.

Common Roof Problems



Keeping the Valley Clean

If you're building a home and have excess materials, if you're not sure how to get rid of your household trash, or if you're looking for ways to recycle, there are many options and resources available to help reduce what goes into our landfill and to preserve the natural beauty of the Methow Valley. See the resources section, pp. 30-31, for more information.

Construction Waste
Waste around a construction site creates an unsafe and inefficient work environment. By including waste management and disposal as part of your building contract, you can encourage systems to sort and reuse materials. Some construction waste is suitable for burning. However, composite (chipboard and particle board) and chemically treated wood are not. Regular trips to the dump to dispose of materials such as these involve minimal cost. Also, there are many local websites that offer a free bulletin board where you can advertise reusable building scraps.

Household Garbage
Garbage left unattended attracts wildlife looking for an easy meal. This can lead to a dangerous situation for children, pets, visitors and domestic livestock. To reduce the chances of habituating wildlife to people, invest in one of the many residential bear-proof containers available.

Recycling
Methow Recycles, a local nonprofit largely run by volunteers, accepts aluminum, metal cans, corrugated cardboard, paper, plastic, glass and other recyclables at the Twisp Transfer Station.

Heading up Cougar Mountain from the Gunn Ranch. *Larry Miller*

Resources

Public Agencies

Okanogan National Forest: 996-2871
Natural Resource Conservation Service: 509-422-2750
Okanogan County:
  Planning Department: 509-422-7160
  Building Department: 509-422-7110
  Noxious Weed Office: 509-422-7165
  Public Works: 509-422-7300
WA State Department of Transportation: 997-3081, 509-826-7364
WA Department of Natural Resources, northeast region: 509-684-7474
US Fish and Wildlife Service: 509-548-7573
WA Department of Ecology: 997-1364
WA Department of Fish and Wildlife, Region 2 office: 509-754-4624
WDFW Methow Wildlife Area manager: 996-2559

Fire

Department of Ecology (burning permit applications): 800-527-3305
To report a wildfire: 800-323-BURN, 800-562-6010 (USFS) or 911

Local Natural History & Restoration Information

The Methow Naturalist: 997-9011
Rendezvous Reclamation (farming): 996-3526
Wild Hearts Nursery: 996-2368
Okanogan Conservation District: 509-422-0855
Methow Natives (nursery): 996-3562
Plantas Nativa (weed control): 997-0379

Injured or Problem Wildlife

State game warden: 509-754-4624
Animal Hospital of Omak: 509-826-5070

Power

Okanogan County Electric Co-op: 996-2228
Okanogan County PUD: 800-922-7011
Energy Solutions: 996-2763

Trash, Reuse & Recycle

Twisp Transfer Station: 997-2025
Methow Recycles: 996-3398
Methow Valley Sanitation: 997-8862
Havillah Shake (recycled wood & beams): 509-486-1467

Canada goose. *Joyce Bergen*

Publications Available from the Methow Conservancy Library

Living Near Water

Exploring Wetlands Stewardship, A Reference Guide for Assisting Washington Landowners, Washington State Department of Ecology (Pub. 96-120)
Production and Habitat of Salmonids in Mid-Columbia River Tributary Streams, Mullen et. al., US Fish and Wildlife Service, 1992

Fire

Fire Risk Rating for Homes, Northwest Interagency Fire Prevention Group
Protecting Your Home From Wildfire, National Fire Protection Association
Fire Protection in the Wildland/Urban Interface, National Wildland/Urban Interface Fire Protection Program

Local History

A View of the Methow: from Moccasin Lake Ranch, James C. Pigott
The Smiling Country, Sally Portman

Weeds

Weed Invasion! Are You Spreading Noxious Weeds?, Wenatchee USFS office
Biological Control of Weeds in the West, Western Society of Weed Science
Biology and Management of Noxious Rangeland Weeds, Roger Sheeley and Janet Petroff

Building

Building Philosophy: A Pattern Language, Christopher Alexander
How Buildings Learn, Stewart Brand
Cold Climate Builder's Guide, Energy Efficient Building Association
Affordable Resource Efficiency Handbook, Center for Resourceful Building Technology
Super Good Cents Builder's Field Guide to Energy Efficient Construction, OSU Energy Extension Program

CONSERVANCY LINKS

Visit the Methow Conservancy website at www.methowconservancy.org for links to numerous Methow Valley resources.

THANK YOU!

Many people contributed long hours to help the Methow Conservancy with this handbook. Special thanks to: Joyce Bergen, Michele Bianchi, Midge Cross, Scott Fitkin, Ellen Lamiman, Dennis O'Callaghan, Debra Prentice, Dick & Sue Roberts, Leigh Ann Robinson, Sussi Rowntree, John Sunderland and Kent Woodruff. This handbook was made possible through the generous support of the Mountaineers Foundation, the Hugh and Jane Ferguson Foundation, the Community Foundation of North Central Washington, NaturalHealers.com and the businesses listed on the back cover.

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509.996.8148 winthrop
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The Methow Conservancy exists to inspire people to care for the land of the Methow Valley.

315 Riverside Avenue • Winthrop, WA 98862
509-996-2870
www.methowconservancy.org