Passive Solar Home Design

Your home's windows, walls, and floors can be designed to collect, store, and distribute solar energy in the form of heat in the winter and reject solar heat in the summer. This is called passive solar design or climatic design. Unlike active solar heating systems, passive solar design doesn't involve the use of mechanical and electrical devices, such as pumps, fans, or electrical controls to move the solar heat.

Passive solar homes range from those heated almost entirely by the sun to those with south-facing windows that provide some fraction of the heating load. The difference between a passive solar home and a conventional home is design. The key is designing a passive solar home to best take advantage of your local climate. For more information, see how a passive solar home design works.

You can apply passive solar design techniques most easily when designing a new home. However, existing buildings can be adapted or "retrofitted" to passively collect and store solar heat.

To design a completely passive solar home, you need to incorporate what are considered the five elements of passive solar design. Other design elements include:

- Window location and glazing type
- Insulation and air sealing
- Auxiliary heating and cooling systems, if needed.

These design elements can be applied using one or more of the following passive solar design techniques:

- Direct gain
- Indirect gain (Trombe wall)
- Isolated gain (Sunspace).

When incorporating these design elements and techniques, you want to design for summer comfort, not just for winter heating.

Your home's landscaping can also be incorporated into your passive solar design.

Learn More
Evaluation Tools

- Solar Radiation Data Manual for Buildings
  Renewable Resource Data Center
- SunAngle
  DOE Building Energy Software Tools Directory

Related Links

  Partnership for Advancing Housing Technology
- Passive Solar Design
  A Sourcebook for Green and Sustainable Building

Reading List