

The high-tech house offers relief from summer heat not only by means of power-hungry air conditioners, but also through shade trees placed along the south side of the building. Even in the active solar house, these straightforward measures help heat the house without pumps, motors, ducts, and burners. For a house in the Northeast, for example, it makes good solar sense to design small windows on the north facade, to shut out cold winds, and large windows on the sunny south side, to absorb the warm rays. In the summer this arrangement prevents gaping losses of cooled air; in winter it locks out intrusions of cold air. Active solar systems rely on moving parts such as heat exchangers and computer-controlled window curtains. Increasingly, so-called solar mass is being used to enhance the natural space heating that occurs when the sun streams in through windows. Other simple design measures also qualify as passive improvements in heating and cooling. Similarly, a walkway between an unattached garage and a house can cut heating losses through an uninsulated garage. Unconventional ways of improving heating have received widespread attention since the 1973 oil embargo. So-called passive solar systems stress proper orientation of the house and using the sun to heat spaces and materials. Someone arriving opens the outer door, enters the foyer, and closes the door. The methods hinge largely on harnessing the power of the sun. Building a sun room on the south side will bring warmed air into the rest of the house, but a low stone wall at the rear of the sun room, rather than a standard wall, will absorb the sun's heat and reradiate it into the house long after the sun has set. Heat in winter can come from a gas-fired furnace and also from warm air radiated from a solar mass beneath the floor. A simple front door can be enhanced with a small foyer that has an inner and outer door. "Passive solar" really means smart design. Smarter design and new technology are keeping the options open. He may hang his coat and leave his muddy shoes there, then open the inner door and enter the house.