



## Planning a New Home for Solar Heating

### Site Planning

Locate your home so will have unobstructed sun from the south. Consider buildings, trees, hills and other potential shade factors.

### Collector Location

The solar collectors need to face southward and are usually mounted high on a wall or the roof to enjoy unobstructed sunshine. The evacuated tube technology used by Simple Solar is not that sensitive to due south – being off 20 degrees results in a solar energy loss of 1.5%; 30 degrees loses 3% and 40 degrees off south loses 5%.

The tilt of the solar collectors is very important. Refer to our chart showing the annual energy curve for a number of tilts. For space heating, a vertical collector position is ideal, such as on a south-facing wall. For domestic hot water we recommend incorporating a 65 degree tilt to obtain relatively constant energy year round. A hip roof or an awning can achieve this tilt without protruding from the building perimeter. In some cases panels mounted in multiple locations can provide superior results such as two panels on the roof at 34 degrees (8:12 pitch) and two panels on a south facing wall.

### Heating System

You can use solar energy for space heating as well as domestic water heating by designing your home to include a hydronic heating system. Methods that use heated water for space heating include in-floor hot-water piping, radiant baseboard and fan-coil forced air systems.

Although every home has its own heating load, as a rough guideline plan on one 30-tube collector for every 150 square feet of finished area for space heating. A 1500 square foot house will need 10 panels for space heating, and a 2400 square foot house requires 16 panels. In addition to space heating, plan on one collector for every two people for domestic water heating.

If your building design can not accommodate the recommended number of panels, the solar system can provide just the domestic hot water and possibly a portion of the space heating. Alternatively, if you have an acreage you may want to consider a 'solar fence' – a number of solar collectors placed on the ground.

### Pipe Chase

For solar thermal systems a supply pipe from the utility room and return pipe from the collector are required. Simple Solar's system has overheat protection so PEX pipe is adequate although some people prefer copper for additional heat resistance. Use ½" copper or ¾" PEX to service up to six panels. Use ¾" copper or 1" PEX for larger systems. All pipes need to be insulated to reduce heat loss and protected from puncture and wear. Ideally, one 4" or two 2" PVC lines can be provided between the utility room and the collector area to serve as a conduit for the solar system lines. In addition to the pipes, one 14x2 electric cable is required for each DC pump. Simple Solar recommends one pump for every three panels so you will need two electric cables for four to six panels, three cables for seven to nine panels etc.

### Utility Room

Be sure to allow space for your solar tank. At a minimum one 300 liter solar tank is needed for domestic hot water tank. The 300 liter solar tank is 24" diameter and 76" tall. If solar space heating is being planned, allow for more or bigger tanks as well as distribution pumps and controls.