



solarcentury

Passive solar design in architecture

Solar Design is the use of architectural features to replace the use of grid electricity and fossil fuels with the use of solar energy and decrease the energy needed in a home or building with insulation and efficient lighting and appliances.

Architectural features used in solar design include:

- Large south-facing windows and minimum north-facing glazing.



- Use of materials with high thermal mass any masses such as walls or roofs that absorb and hold the sun's heat. Materials with high specific heat capacities, like stone, concrete, adobe or water work best.

- High levels of insulation to reduce heat loss.
- Sunspaces such as conservatories on south-facing elevations. These collect heat which can be distributed throughout the building and reduce heat losses by creating a 'thermal buffer'.
- Solar lighting - The interior of a building can be lit during daylight hours using fibre optic light pipes connected to a parabolic collector mounted on the roof.
- Insulating shutters for windows to be closed at night and on overcast days. These trap solar heat in the building.
- Fixed awnings positioned to create shade in the summer.
- Double envelope construction – the occupied compartment is completely surrounded by an insulated weather-proof shell, inside which solar warmed air circulates.
- Solar chimneys for cooling.
- Planting deciduous trees near the windows. The leaves will give shade in summer but fall in winter to let the sunlight enter the building.
- Features such as sun-shelves to increase the level of daylight to reduce the need for artificial lighting.

Read on for further information or download our Solar Energy Fact Sheet

- [Introduction to Solar](#)
- [Passive solar design in architecture](#)
- [Solar thermal heating systems](#)
- [Electricity from the sun](#)
- [Types of PV system](#)
- [A bright future for PV](#)
- [Less common types of solar technology](#)