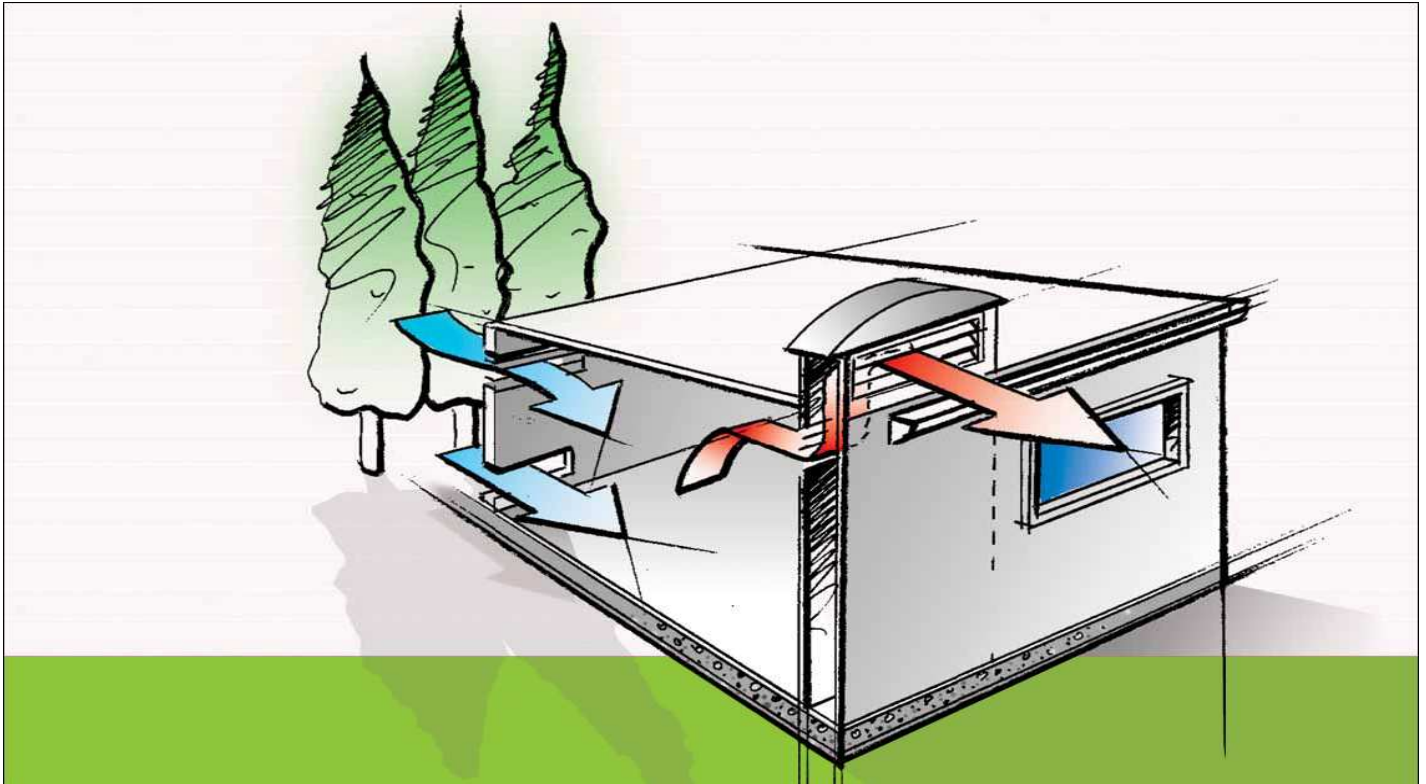


Ventilation Systems: Solar Chimney

Victorian Solar Initiative: Solar Innovation Ideas



HOW IT WORKS

- > Solar chimneys are constructed to actively promote ventilation of unwanted heated or stale air by drawing fresh cooler air from vents at lower levels.
- > The exchange and movement of air cools the building by driving heat to the outside. The process by which this movement of air occurs is called natural convection. Natural convection is created by solar energy heating air within the chimney.
- > The heated air escapes out the top of the chimney and is replaced by air from the outside (through windows or vents elsewhere in the building).
- > In winter the chimney vents to the outside can be closed and heated air in the chimney forced (using fans, or other air handling system) into the building for heating purposes.

WHAT IT LOOKS LIKE

- The basic features of a solar chimney include:
- > A narrow configuration (like a chimney) with a heat absorbing material on the inside behind a glazed north-facing front.
 - > A chimney which terminates above the roof level.
 - > A vent at the top of the chimney that heated air to exhaust without being overcome by the prevailing wind.

HOW IT SAVES ENERGY

- > Provides interior cooling and heating to complement conventional climate control systems.

HOW IT IS INNOVATIVE

- > Emerging use in Victoria, particularly on iconic commercial buildings.
- > Can be used as a design feature to enhance facility aesthetics.

APPLICATION

- > Solar chimneys can be integrated into a building with open stairwells and atria, however be aware of potential heat loss and heating difficulties in winter.
- > Solar chimneys are most effective in hotter climates with high cooling load.
- > Sunrooms can also be designed to function like solar chimneys.

WHERE DEMONSTRATED

- > 60L The Green Building, Carlton, Victoria
- > Monash Science Centre, Clayton, Victoria
- > Padua College, Mornington, Victoria
- > Victoria Barracks, Sydney, NSW
- > Building Research Establishment, Gorston, UK