

SOLAR/THERMAL CHIMNEY PROCESS

HOW IT WORKS

A solar chimney is a passive solar ventilation system. It is a way of improving natural ventilation within a building as well as providing heating or cooling by utilising heat from the sun to enhance the natural stack effect ventilation through a building. It is also used as a renewable power generation source.

The solar chimney is a system that has been used for centuries, particularly in the Middle East by the Persians and in Europe by the Romans, for passive heating and cooling within buildings.

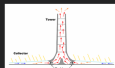
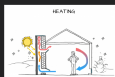
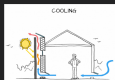
The tall chimney is generally coated in a material with high thermal absorptivity. As it absorbs heat energy from the sun during the day it increases the temperature of the air within the chimney, creating an upward movement of air within the chimney. This creates a suction at the base of the chimney.

RESIDENTIAL/COMMERCIAL

In a residential situation this suction can either be used for ventilation and cooling in hot weather or in cold weather the top of the chimney can be shut and a vent near the top of the chimney directing the warmed air back into the house. Thermal massing can also be used on the house side of the chimney to provide heating to the interior spaces at night time. This method of ventilation and cooling is especially useful in very hot climates with low wind where other methods like wind scoops would be unsuitable. In a residential situation a solar chimney is often used in conjunction with a geothermal heat exchanger to provide cool air into the building interior.

POWER GENERATION

In a renewable power generation situation either reflective surfaces are used to reflect the sun's rays onto a central tower



Solar Chimneys for Sustainable Cooling

United Arab Emirates

A solar chimney is a passive ventilation system that utilizes solar energy to enhance natural ventilation.

Affordable and Clean

Industry Innovation

7 AFFORDABLE AND CLEAN ENERGY



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

