

Solar Thermal

Unlike the conversion of solar radiation into electricity as is done by photovoltaic panels, solar thermal is using radiation from the sun to increase the heat in a liquid or gas (pure water, mixture with water or air). By adding water or air to the system the overall efficiency of converting the solar radiation to energy is increased however there are limitations to the transportation and uses of this energy.

Solar Thermal is a very developed industry that has provided reliable sources of heated air and water for decades to many developed and developing communities around the world. Much of the manufacturing and use of Solar Thermal Systems has been concentrated within China but with a growing distribution to Europe. For North America and in specific Ontario, the incentives from government exist for Solar Thermal systems but a very low cost on natural gas and the higher costs of the supporting hardware has been limiting the market penetration of the product. When there are applications where the heated water and air can be used for space heating it then provides a more firm case for investment.

The range of complexity for systems that can be designed for the residential and industrial applications is very extensive. Due to the transportation of air or water the systems must be properly sized for hardware to ensure maximum efficiency is achieved with no compromise on durability or continuous operation. In a system, for example, where thermal hot water is used directly (shower, washing or drinking/cooking) along with the space heating, such hardware devices as heat exchanges and added pumps can remove any benefits from the renewable energy if the system is not designed properly.

Below is a diagram of a typical solar hot water thermal system. The amount of hardware and sizing of each piece will vary from project to project and will be determined by the users needs. Please refer to our references to understand the variety of applications IES has found for Solar Thermal.

Industrial applications of solar thermal systems has not developed as much as residential use. However, Internat Energy Solutions (IES) has been able to develop several very interesting applications in the industrial sector that have been applied to manufacturing processes that require high amounts of hot water. The solar thermal systems have been used to supplement the hot water needs of these manufacturing facilities. Along with being a high consumer of hot water it is necessary for installation conditions to be ideal for solar radiation absorption. As with photovoltaic systems there are some factor that determine if a building or site is ideal for solar thermal.