

Solar Sun World's Incorporation of PV and Solar Thermal Systems into the Florian Greenhouse

The Florian Greenhouse is no ordinary greenhouse. It encompasses a “Ground to Air Heat Transfer” (GAHT) system which always maintains the proper air temperature and humidity levels inside the greenhouse. The foundation of the greenhouse contains a piping system through which air will flow once the installation is completed, and an intake and an exhaust pipe are mounted on opposite sides of the greenhouse. The GAHT systems, through its automated controls, steer whether the greenhouse needs to be heated or cooled. If it needs to be cooled, hot air is drawn in from the outside through the intake pipe and sent through the underground pipes with the help of an inline fan. Consequently, the air is cooled to the temperature of the soil. At the end of the pipes, the air is then released into the greenhouse via the exhaust pipe, cooling the greenhouse. Through this process, the soil absorbs all humidity in the air and is therefore dehumidified. Dehumidified air in the greenhouse is vital for reducing the risk of pests and diseases. At night or on cold days when the ground is warmer than the outside air, the outside air is circulated through the pipes, just like it was for the cooling process. This time, however, the cold outside air is warmed by the soil and flows into the greenhouse much warmer, thus heating the greenhouse.

The GAHT System demonstrates a low cost, sustainable heating, but Solar Sun World incorporated a photovoltaic and solar thermal system to reduce the cost of heating and cooling to a minimum. Above the underground piping system lay 1,000 ft PEX pipes arranged with many loops. These pipes are filled with water. In the winter months, the sun heats the propylene glycol in the 5 solar thermal panels. This heat is then transferred via a heat exchanger to heat the water in the PEX pipes. The circulation of water in the pipes not only heats the air in the pipes of the GAHT system, but can also be used to water the plants. In the summer, well water is pumped through the PEX pipes cooling the air in the pipes of the GAHT system. Again, the water can then be used for irrigation of the plants in the greenhouse. The photovoltaic panels provide all electricity needed in the greenhouse, e.g. lights, pumps, fans, etc.

With the combination of the GAHT system and Solar Sun World's photovoltaic and solar thermal systems, the Florian Greenhouse is a sustainable and low-cost greenhouse suitable for both commercial and residential application of all sizes.

Call us today if you are interested in a greenhouse just like this one!



