

## Solar Thermal Applications

Energy is what drives the world and the need for energy is rising exponentially due to growing population and a strong desire to create a digital, autonomous and industrialized world around us. Our heavy dependence on fossil fuel to generate energy has gravely impacted the natural climate of earth which in turn has made agricultural practices more challenging.

Latent heat thermal energy storage system (LHTESS) is the most interesting technique to store thermal energy which utilizes phase change material (PCM) as a storage medium. Currently, LHTESS has been adopted in various fields including heating and cooling of domestic buildings, refrigerators, solar power plants, waste heat recovery, photovoltaic electricity generations and domestic hot water systems.

The current study is focused on finding the possibility to integrate LHTESS in various suitable solar thermal processes in agricultural. The setup consists of a laying Scheffler reflector, heat receiver, PCM storage tank, heat exchanger and a thermal oil reservoir. The laying type Scheffler reflector generates high radiation flux at the bottom of receiver causing a rise in temperature of thermal oil inside the receiver. Heated thermal oil is then introduced to PCM storage tank to exchange thermal energy with PCM after which it is reintroduced to receiver to repeat the cycle. The heat exchanger is used to transfer the thermal energy from PCM to the suitable agricultural process whereas the oil tank acts as a reservoir for thermal oil.

