

**Private Residence  
Leipurs Fork TN**

**High Performance Renewable Energy Roofing System**

This project is an outstanding example of new construction that incorporates a cutting edge roofing system assembly that includes a cool metal roof, and building integrated PV (solar electric) and solar thermal systems that provide electricity for the home, as well as solar thermal energy (heat) for water and swimming pool heating. The architecturally integrated roofing assembly provides both energy efficiency (reduced heating and cooling costs) and renewable energy systems in a cost effective and attractive package.

The solar roof is approximately 10 square in area and roofed with PV laminates that are bonded to a 24 gauge galvalume steel standing seam roofing system that is installed over the integrated solar thermal system. The renewable energy system has a 3kW PV rating (electricity) and a 6 kW thermal equivalent rating, producing the equivalent of ~11,800 kWh annually while reducing the carbon footprint of the house by 16,800 pounds of carbon annually.



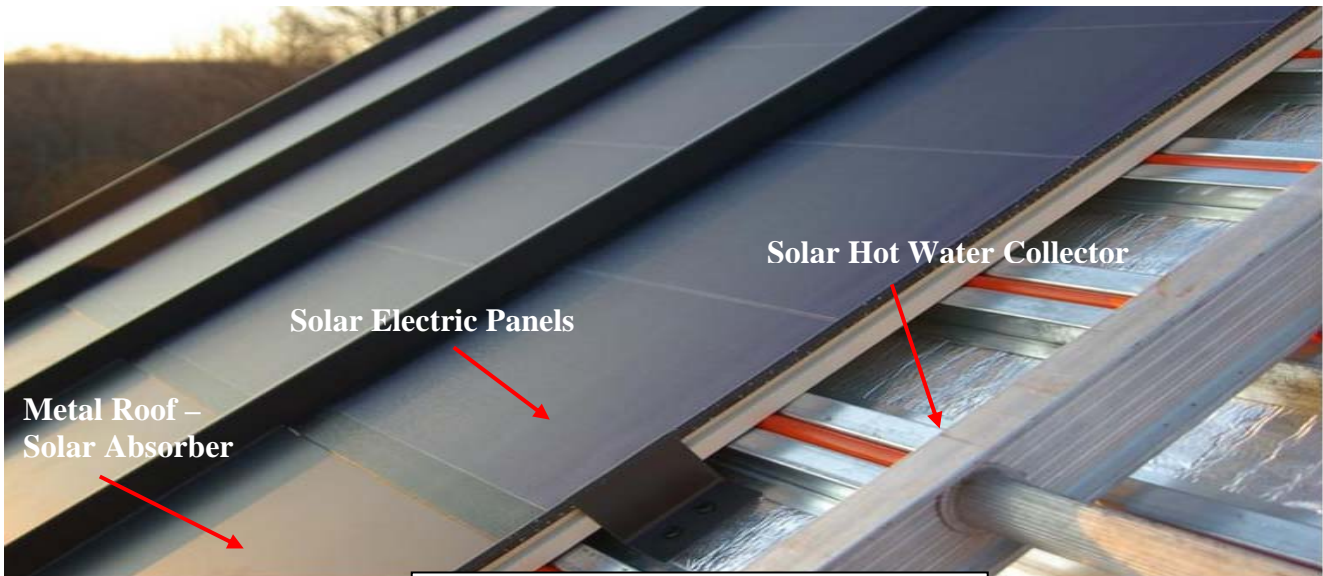
The **Dawn Solar Thermal System** collects solar heat from beneath the roof area. A non-toxic propylene glycol antifreeze solution circulates under the hot roof and moves energy between the Dawn Solar collection system and the heat exchanger(s) within the solar storage tank. Operation of the solar collection circulator is controlled by solar differential controls that monitor the temperature difference between the collector and the bottom of the solar storage tank.

In the **Domestic Water Heating**; when domestic hot water is drawn from the main water heater, water replacing it will be preheated by the hot water in the solar storage tank, thereby reducing the use of fossil fuels, bio-fuels or electricity.

In **Pool Heating**; when the pool thermostat calls for heat and sufficient energy is available in the solar storage tank or the solar collector array, pool water is pumped through a pool heater tank, heated by the solar heat exchanger in the tank and returned to the pool. This process continues until the thermostat is satisfied or until the solar energy supply is depleted.

The **PV System** includes a 3 kW grid tied PV-Laminate system (rated at standard test conditions) installed on a 24 gauge galvalume steel standing seam roof with a “cool” roof finish.





Detail photo of the building integrated PV-Thermal roofing system suitable for both residential and commercial new or retrofit roofing projects.