The renewable energy are growing in the potential place of the world. Thailand has high potential of solar irradiation. There is about 5.2 - 5.5 kWh/m²/day that it is located at the equatorial belt. Thailand has dramatic growth of PV systems installation through 10 year, from 2008 to 2017. Thailand has 2,744 MWp of PV power plants installation at the middle of year 2017. These are 22 % of large systems which are more than 10 MW of capacity and 78 % of small systems which are less than 10 MW of capacity. In the utility regulation the large system is called SPP (Small Power Producer) and the small is called VSPP (Very Small Power Producer) due to the compare to the conventional power plants capacity.

The Alternation Energy Development Plan (AEDP) 2015 aims to 6,000 MWp of PV systems installation target in 2035. The challenge of PV installation target was from 500 MWp in 2008 to 3,800 MWp in 2014. Most PV modules in power plants are crystalline silicon solar cell technology, both mono-crystalline and poly-crystalline as 78 % of totalling PV power plants installation. The others are amorphous thin film, CIGS, CdTe and amorphous on microcrystalline silicon.

The module temperature effects to electrical output of PV system with typical value is 0.5%/°C. This study aims to investigate the equilibrium module temperature of PV power plant which is located in the tropical climate as Thailand. This PV plant capacity is 9 MW and module technology is polycrystalline silicon. The maximum temperature of crystalline PV module is up to 60 °C of hottest months of the year. There are six point of module temperature sensors in 2 km². In figure 1 illustrates the module temperature of 6 zones, (A) is on 20 March and (B) is on 22 September 2016. Both is equinox day of 2016. The range of operating conditions consist of the irradiance: 200 – 1000 W/m², wind speed: 0.25 – 1.75 m/s, and ambient temperature: 5 – 35 °C. The relationship of irradiance and equilibrium module temperature at the operating condition through year 2016 will be reported.

![Figure 1: Irradiance and module temperature: (A) on 20 March 2016 and (B) on 22 September 2016](image-url)