**Problem Statement:**

**Forecasting to optimize solar power generation**

**Background:**

The world is waking up to the deleterious effect of fossil fuels on our environment. As the doomsday clock ticks away, human beings are turning to renewable energy to avert a possible apocalypse. Fortunately, the sun is a well-spring of clean energy.

**Objective:**

A solar power generation company wants to optimize solar power production and needs the prediction model to predict ‘Clearsky DHI’, ‘Clearsky DNI’, ‘Clearsky GHI’. The data is ten years at an interval of every 30 mins with the following data points:

['Year', 'Month', 'Day', 'Hour', 'Minute', 'Temperature', 'Clearsky DHI', 'Clearsky DNI', 'Clearsky GHI', 'Cloud Type', 'Dew Point', 'Fill Flag', 'Relative Humidity', 'Solar Zenith Angle', 'Pressure', 'Precipitable Water', 'Wind Direction', 'Wind Speed']

**Data Attributes:**

* ‘Year',
* 'Month',
* 'Day',
* 'Hour',
* 'Minute',
* 'Temperature', 0C
* 'Clearsky DHI', w/m2
* 'Clearsky DNI', w/m2
* 'Clearsky GHI', w/m2
* 'Cloud Type',
  + Cloud Type 0    Clear
  + Cloud Type 1    Probably Clear
  + Cloud Type 2    Fog
  + Cloud Type 3    Water
  + Cloud Type 4    Super-Cooled Water
  + Cloud Type 5    Mixed
  + Cloud Type 6    Opaque Ice
  + Cloud Type 7    Cirrus
  + Cloud Type 8    Overlapping
  + Cloud Type 9    Overshooting
  + Cloud Type 10    Unknown
  + Cloud Type 11    Dust
  + Cloud Type 12    Smoke
  + Cloud Type -15    N/A
* 'Dew Point', C
* 'Fill Flag',
  + Fill Flag 0    N/A
  + Fill Flag 1    Missing Image
  + Fill Flag 2    Low Irradiance
  + Fill Flag 3    Exceeds Clearsky
  + Fill Flag 4    Missing CLoud Properties
  + Fill Flag 5    Rayleigh Violation
  + Fill Flag any   N/A
* 'Relative Humidity', %
* 'Solar Zenith Angle', Degree to calculate cos(θ)
* 'Pressure', mbar
* 'Precipitable Water', cm
* 'Wind Direction', Degrees
* 'Wind Speed' m/s