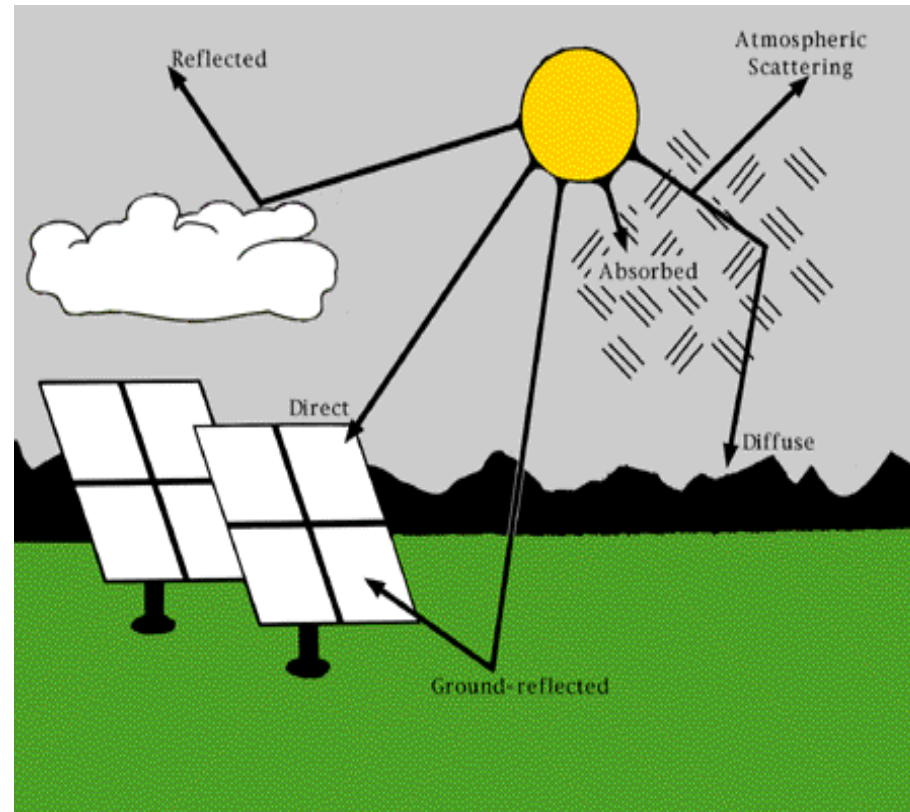


Solar Resource Mapping and PV potential in Myanmar

Solar Radiation Components

- Direct normal (beam)
 - Radiation arrives at collector in direct line from sun
 - Creates shadows
- Diffuse
 - Radiation scattered by molecules, aerosols and clouds, arrives at collector from all directions of the sky
- Clouds
- Geography: mountains, oceans, large lakes
- Latitude and season
- Air quality: pollution, natural haze, volcanic activity
- Altitude



Global Radiation = Direct Normal + Diffuse

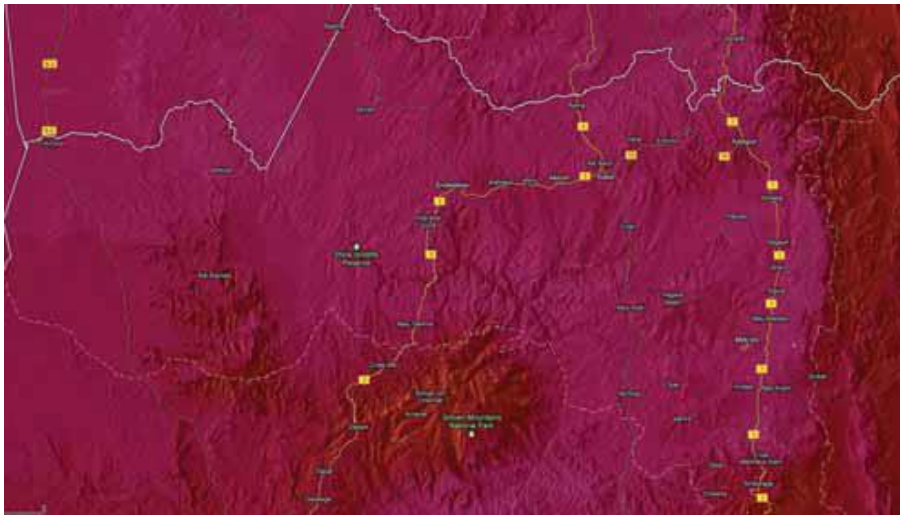
Solar Radiation: How to Measure?



1) Satellite Data

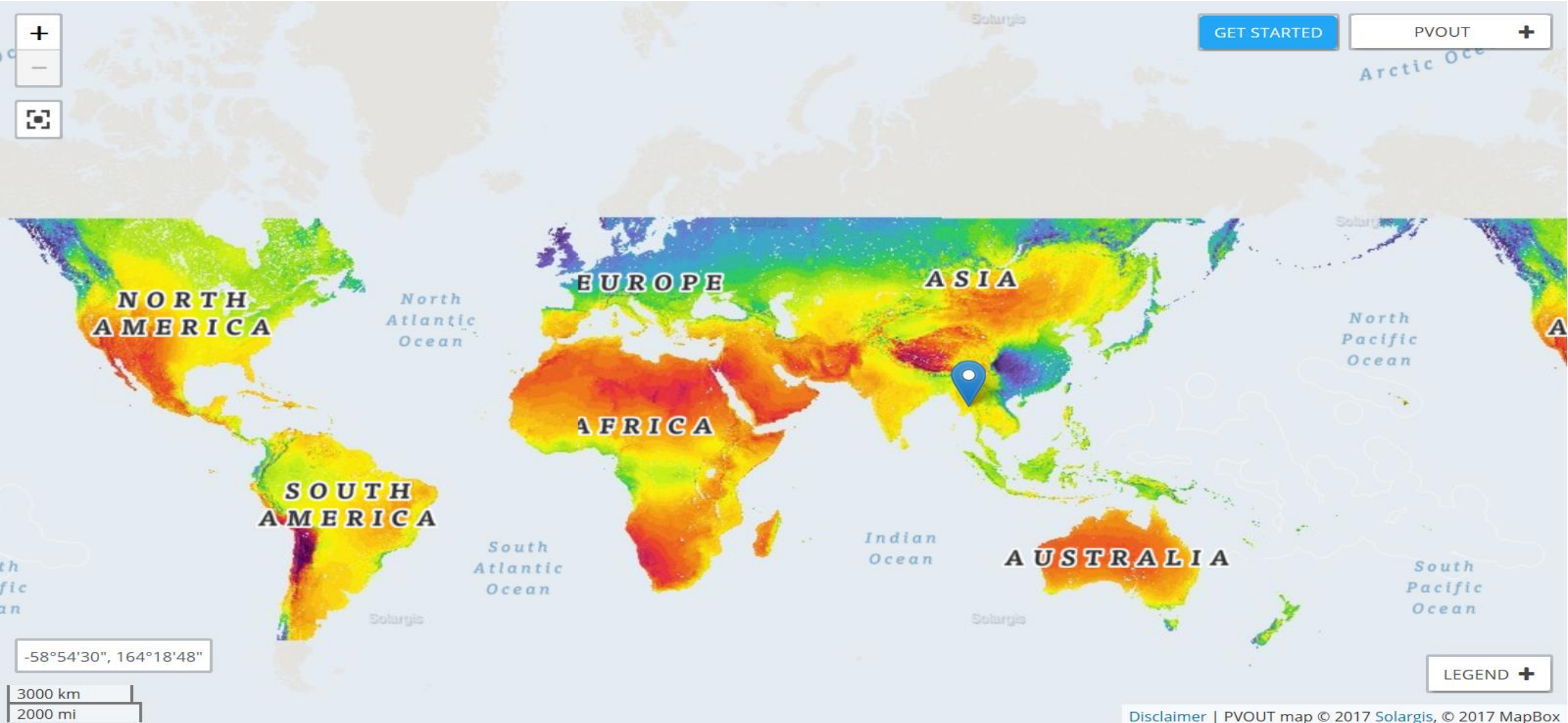
2) Ground Measurements

3) Model simulations (forecasting)

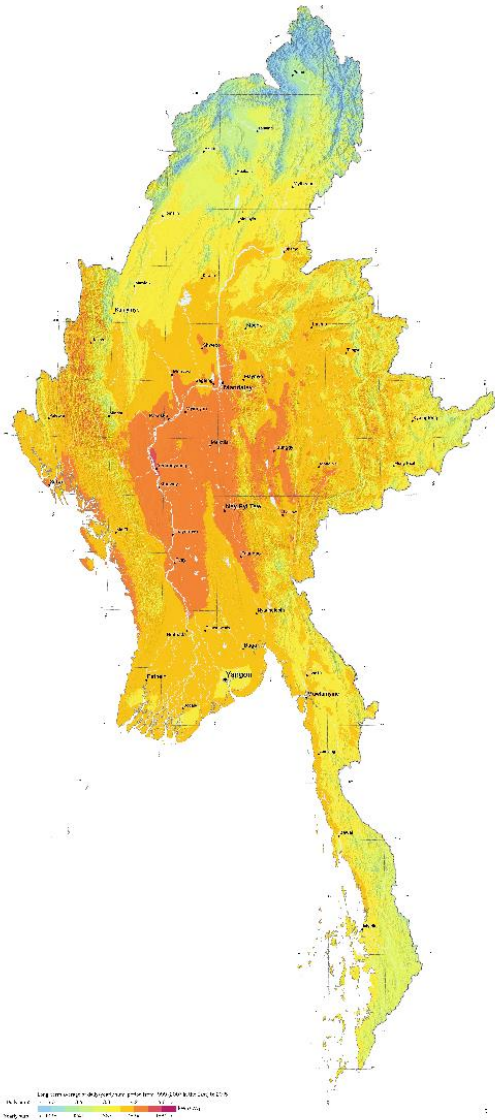


Visit <http://globalsolaratlas.info/>

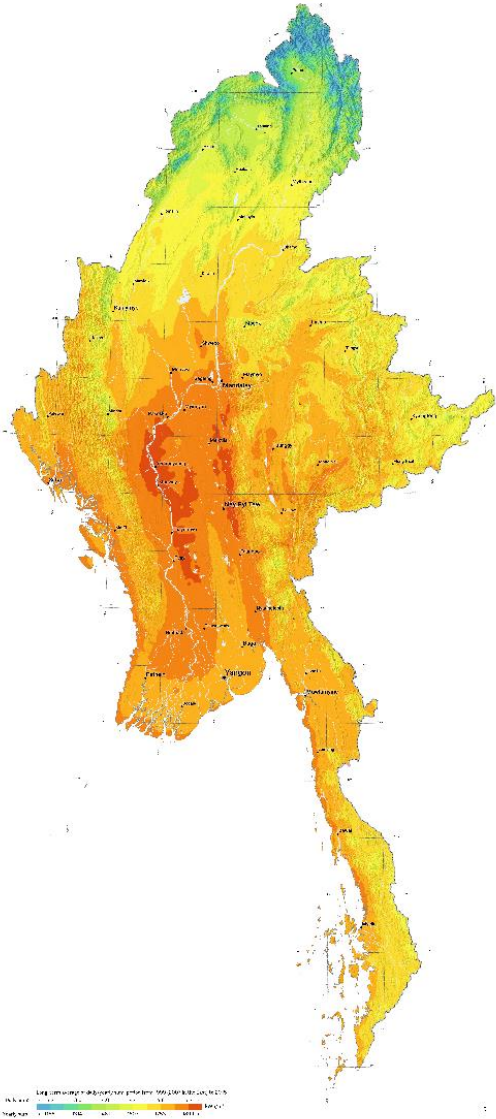
Global PV Power Output



Spatial Variation in Myanmar



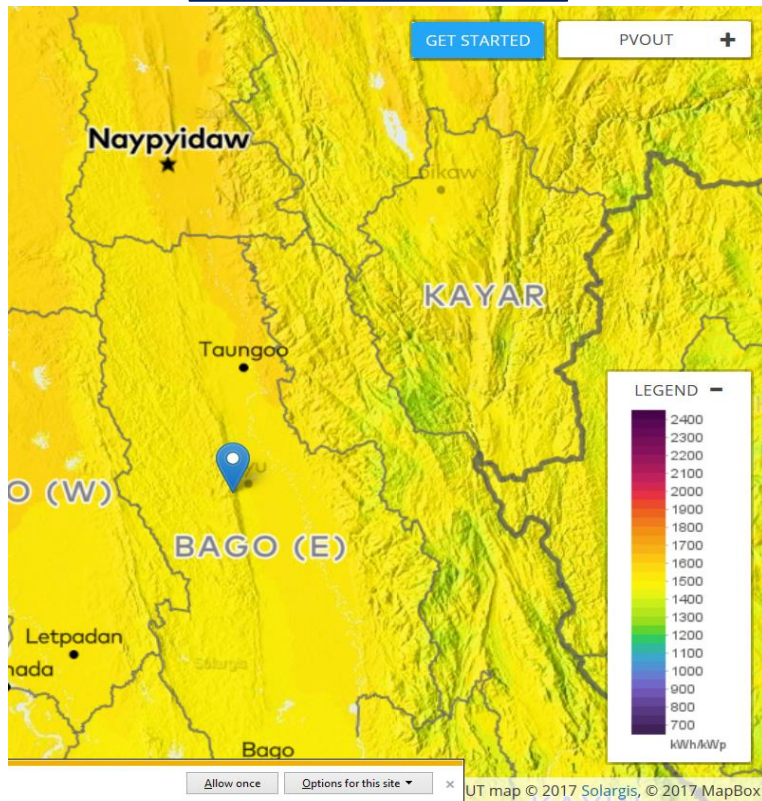
- **Photovoltaic Power Potential (left)**
 - Central Myanmar has 1680kWh/kWp/year and 4.6 kWh/kWp/year



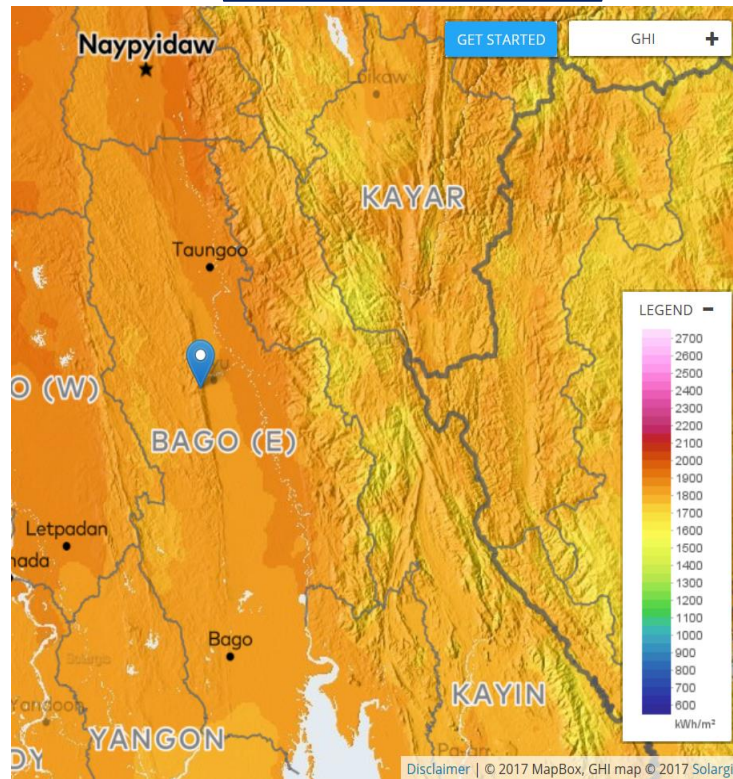
- **Global Horizontal Irradiation (right)**
 - Central Myanmar has > 1899kWh/m2/year

Solar Resources in Kun Chaung Dam, Myanmar

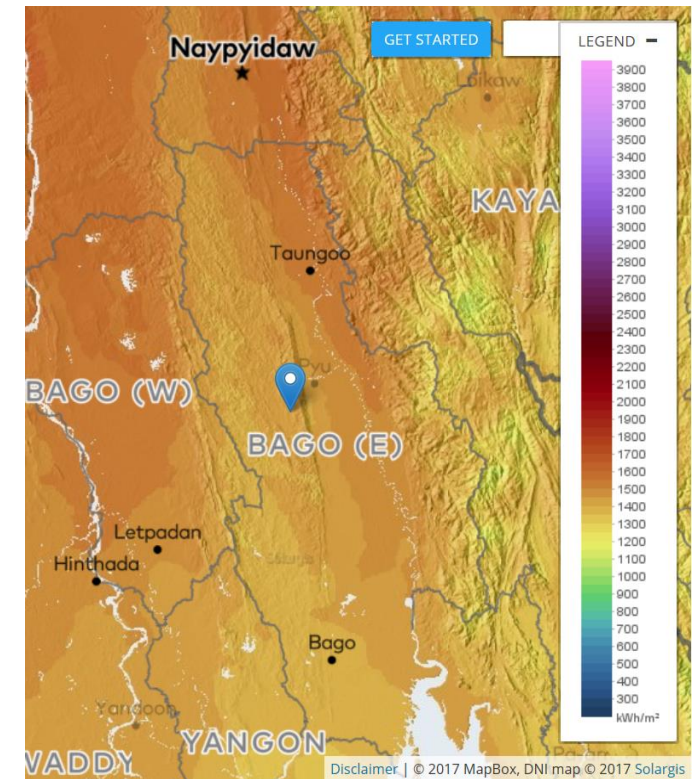
PV Output



GHI



DNI



Geospatial Planning

- Identify cost-effective, environmentally sustainable, socially-equitable renewable energy regions
- Inform long-term planning of transmission and other infrastructure for RE development
- Identification of potential regions for solar project development

Demand +
Transmission/other infrastructure +
Renewable Energy Resources +
Environment/Social +
Economics on one map

➔ Project identification

Questions for Discussion

- What are the drivers for considering grid connected solar in Myanmar?
- How to integrate variable solar power in a weak system with no spinning reserve? How would the grid reliability and stability be affected in MM in integrating the first solar PV plant? The first 5 solar plants?
- What would be a suitable path for the implementation of grid integration mitigation actions in terms of transmission and distributions system investments; FACTS deployment; SCADA/EMS improvements; and development of forecasting systems, at different penetration levels?
- What are the pros and cons of public ownership vs IPP for solar development in Myanmar? First project through EPC? How can the public private partnership for solar projects be structured in Myanmar? Is solar Parks a viable option for Myanmar?
- What are the main challenges in financing solar PV projects in Myanmar? What are the off-taking risks, foreign exchange risks, risks associated to the regulatory framework, and political risks? Is there a role for guarantees for solar projects in Myanmar?
- What in-depth studies are recommended?