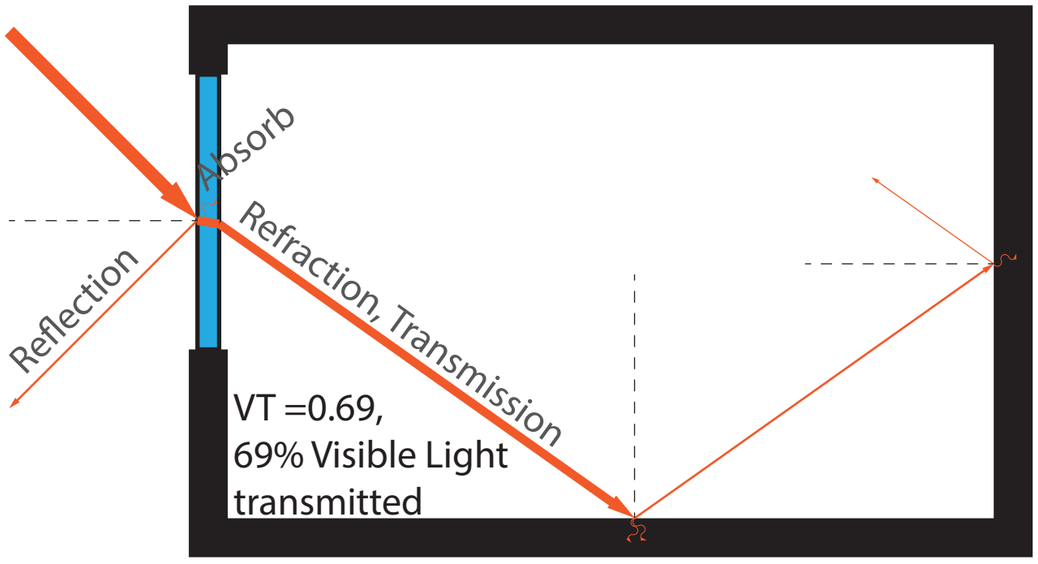
Global Horizontal Irradiance/Irradiation (GHI)

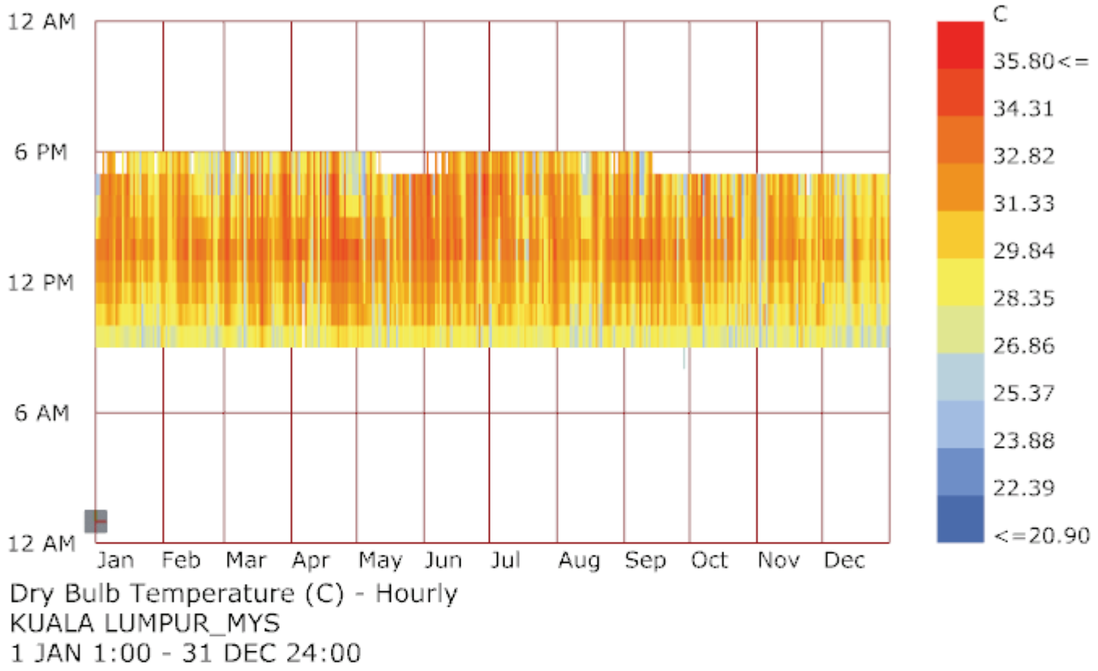
GHI is the most important parameter for calculation of PV electricity yield. In simple language, **Global Horizontal Irradiation (GHI) = Direct Horizontal Irradiation (DHI) + Diffuse Horizontal Irradiation (DIF**)

Direct Horizontal Irradiation=Direct Normal Irradiation
DHI is the irradiation component that reaches a horizontal Earth surface without any atmospheric losses due to scattering or absorption.

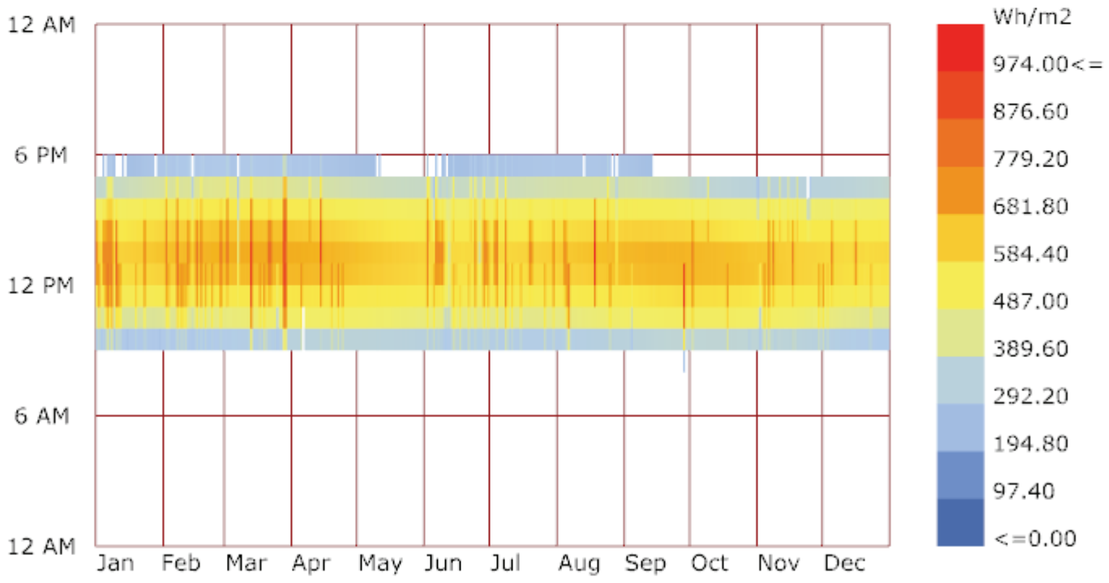
Diffuse Horizontal Irradiation
DIF is the irradiation component that reaches a horizontal Earth surface as a result of being scattered by air molecules, aerosol particles, cloud particles or other particles. In the absence of an atmosphere there would be no diffuse horizontal irradiation.

Use your learnings from the last week exercise and draw series of diagrams that shows what happens to **visible light** once it hits the envelop of a typical room





Dry Bulb Temperature (C) - Hourly
KUALA LUMPUR_MYS
1 JAN 1:00 - 31 DEC 24:00



Global Horizontal Radiation (Wh/m2) - Hourly
KUALA LUMPUR_MYS
1 JAN 1:00 - 31 DEC 24:00

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Imputing EPW file of Kula Lumpa into Ladybug

Process:

{Condition Statement}

Potential for Overheating,

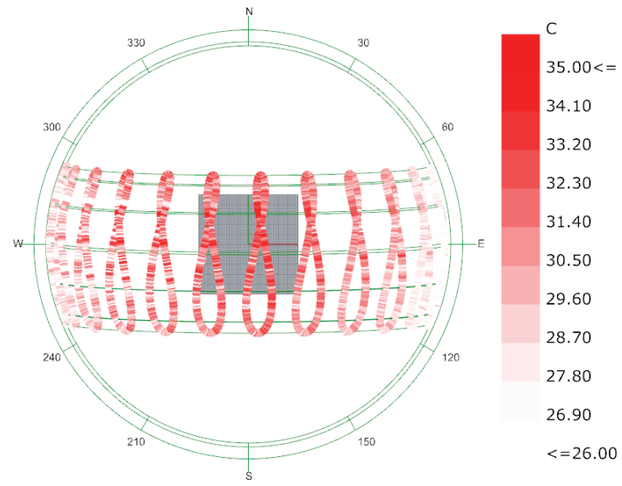
Temperature>22, Global Horizontal Radiation>200Wh/m_2

Result:

3139 out of 8760 hours annually (36%) have overheating potential. Diagram on the left shows how those hours are distributed hourly during whole year. Diagram on the bottom shows all the location of suns which are hotter than 22C.

Passive Design Strategy:

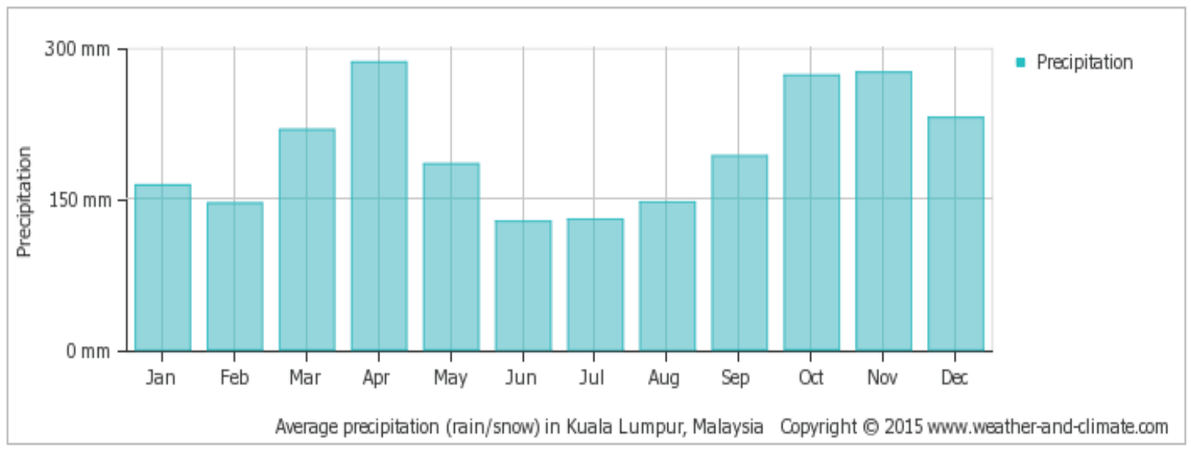
Given the diagram shown on left and bottom, we recommend to use shading for all openings in all direction. Since the bottom diagram shows an outstanding high sun angle, we should choose **horizontal shading fins** over vertical fins in order to improve shading ability. Based on the wind rose and sun pass diagram, we think the project should be **South facing**.



Sun-Path Diagram - Latitude: 3.12
Hourly Data: Dry Bulb Temperature (C)
KUALA LUMPUR_MYS

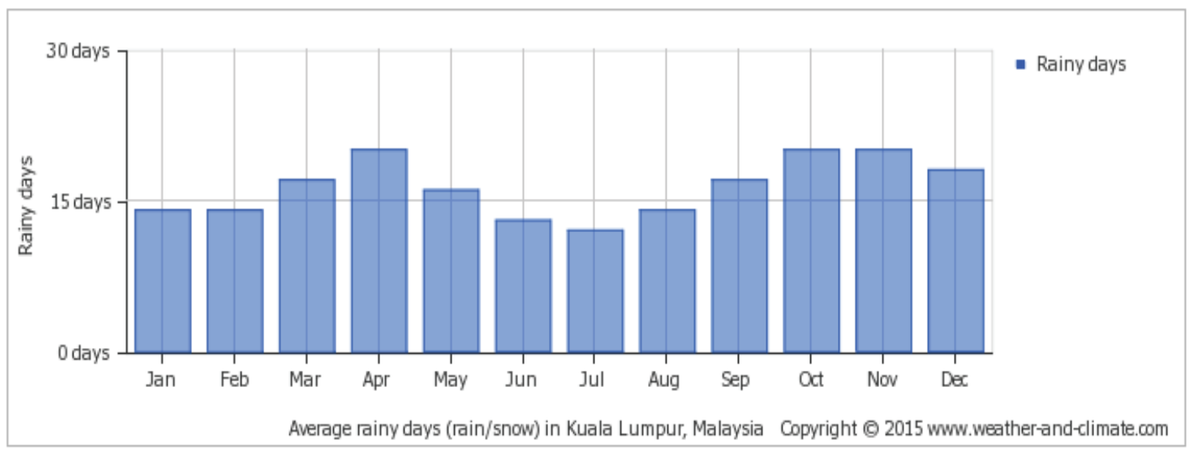
AVERAGE MONTHLY PRECIPITATION OVER THE YEAR (RAINFALL, SNOW)

This is the mean monthly precipitation, including rain, snow, hail etc. Show in Inches »



AVERAGE MONTHLY RAINY DAYS OVER THE YEAR

This is the number of days each month with rain, snow, hail etc.



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Passive Design Strategy:

Given the diagram shown on left , we recommend to use **slope roof surface** to improve rain water collection ability in order to achieve net zero water on site.

Summary:

Given the knowledge I have on this project, I could only give out a few Passive strategies. There are many other suggestions could be draw if I could have more information on the project, like: project area, site condition, surrounding condition.

Since climate change only would make the earth warmer, I don't think it would not affect my design recommandations.