EXERCISE SERIES 3

Exercise 1: Grid-connected systems

Describe, with the aid of a suitable diagram, the basic structure and main components of a grid connected PV-system. Describe also the main function of each of the components.

Exercise 2:

a) Describe curtailment. What are the pros and cons of this technique?

b) Name typical losses that occur in a real grid connected PV system compared to ideal conditions. What parameter can be used to take into account the actual energy output of a PV system, compared to the theoretical one?

c) Explain the concepts of energy yield and performance ratio and when it is relevant to use them.

Exercise 3:

Use PVGIS online tool (https://re.jrc.ec.europa.eu/pvg_tools/en/tools.html) to answer the following task.
Consider residential PV installation with the following characteristics:

- Installed peak PV power = 10 kWp

- System loss = 14

- Optimal oriented slope and azimuth

- PV system cost = 20K CHF

- Interest rate = 3%

a) Explain the effect of lifetime, location, and mounting position on the PV electricity cost.

b) For a tracking PV system compare the yearly-PV energy production (a) With vertical axis, (b) With inclined axis (c) With two axis. Use optimized slopes.