

Thermodynamics and Heat Transfer

Lecture 9: Renewable Energy Systems- Part 1 (50 Points)

Problem 1 (25 Points):

Design a solar PV system (1 MW) for 5 different locations in Finland:

1. Calculate the best tilt and azimuth angle for each case study.
2. Compare capacity factor and power generation of the PV system for each case study.
3. Compare tracking system with non-tracking system for each case study.
4. The results can be compared with the other Nordic countries and Germany (optional).

Problem 2 (25 Points):

Design a wind farm (1 MW, 5 types of wind turbine) for 5 different locations in Finland:

1. Compare capacity factor and power generation of each wind turbine for each case study.
2. The results can be compared with the other Nordic countries (optional).