

Rooftop Solar PV System Optimization and Analysis at Freudenthal Building

Department: Copernicus Institute of Sustainable Development

Research Group: Energy and Resources

Supervisor: Dr. Sara Golroodbari , Prof. Wilfried van Sark

Email: s.z.mirbagherigolroodbari@uu.nl

Phone: 030 2537681

Project Overview

At the Freudenthal Building, we have installed a rooftop solar PV system consisting of over 30 different solar panels. These panels are integrated with a data monitoring system that records the I-V curves of each panel, storing the data in a SQL-based environment. Additionally, the building is equipped with a weather station and an all-sky camera on the rooftop to monitor environmental conditions closely. We have some new solar panels which is physically installed on the rack but need to be connected electrically as well.

Project Goals

- **Ensure Connectivity:** The primary task for the student assistant is to verify that all new solar panels are correctly connected to the data monitoring system and that the system is fully operational.
- **Data Analysis:** Preprocessing and analysing the data to evaluate the performance of different solar panel technologies installed on the rooftop.
- **Hot Spotting Analysis:** Measuring hot spotting on all panels using the IR camera.
- **Portfolio Development:** Compiling a detailed and organized portfolio documenting the rooftop solar PV system's configuration and performance data.

Objectives

- System Check
- Performance Comparison
- Hot Spot Detection
- Portfolio Compilation

Deliverables

- 1- An analytical report comparing the performance of different solar panel technologies, including a hot spotting assessment.
- 2- A detailed portfolio of the rooftop solar PV system, showcasing its design, technology mix, and performance metrics.

Requirements for Participation

- Knowledge of solar PV systems and data monitoring technologies.
- Experience with data analysis, particularly using SQL databases.
- Capability to conduct technical assessments and troubleshooting of solar PV systems.
- Proficiency in report writing and portfolio creation.