## 1. Overview

This report presents a comprehensive analysis of the hourly performance and simulation of a photovoltaic (PV) system installed within a building. The simulation utilizes input data from the PVGIS EU database, which provides information on solar irradiance and other meteorological factors, combined with electricity demand data obtained from submeter readings within the building. By integrating these datasets, the report aims to evaluate the system's efficiency, assess its potential for energy generation, and analyze its impact on electricity consumption and battery storage.

## 2. PV Yield Analysis (All Seasons)

The figure below illustrates the potential performance of the PV system, showcasing several key metrics:

- Electricity Export: The amount of generated electricity that exceeds the building's immediate consumption and is fed back into the grid.

- Direct Self-Usage: The portion of generated electricity used directly within the building to power electrical devices and systems, reducing reliance on grid-supplied energy.

This visualization helps in understanding how effectively the PV system integrates with the building's energy needs and how much of the generated electricity is used on-site versus exported.
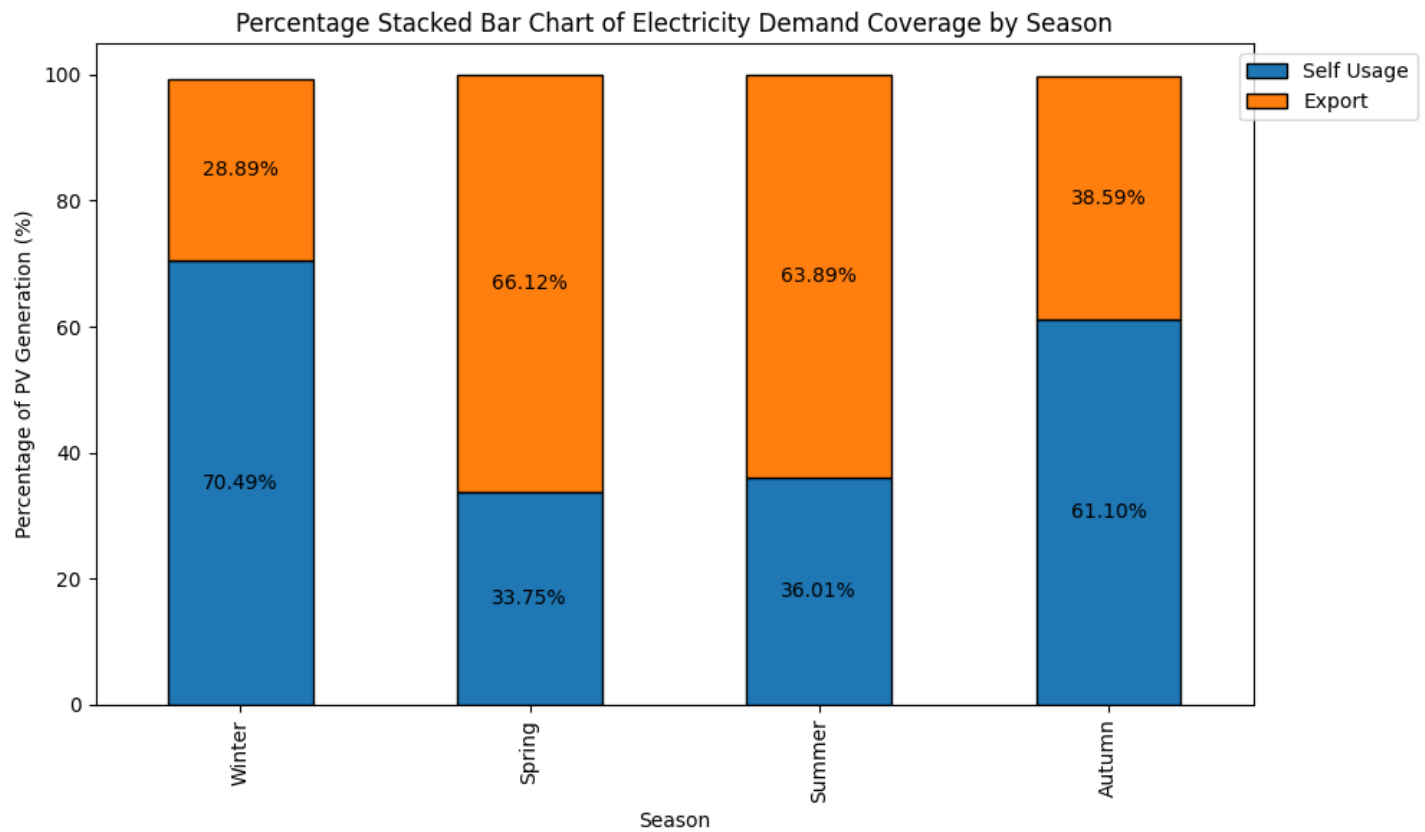
### 3. System Characteristics (All Seasons)

The subsequent figure provides a detailed depiction of the PV system's energy flow characteristics. It includes:

- Energy Storage: The process by which excess energy is stored in the battery, highlighting how much energy is captured and retained for future use.

- Energy Consumption: The energy utilized by the building electrical devices and systems, including any direct consumption from the PV system.

- Energy Export: The surplus energy that is sent back to the electricity grid after meeting the building's needs and battery storage requirements.

This figure offers insights into the efficiency of energy management within the system and identifies areas for optimization to enhance overall performance.



Percentage Stacked Bar Chart of Electricity Demand Coverage by Season