Instruction on how to run the demo.

A demo example of an Energy management system (EMS) for a micro grid has been implemented using PyPSA power flow.

The goal of the EMS system is optimizing the energy usage in micro grid and minimizing the impact of the micro grid into an external grid -> Assume that the energy deliver back (export) to the grid has no pay back, the electricity imports from grid are expensive and there are differences between day and night tariff. The micro grid has battery and internal storage. The network is shown in figure 1.

The EMS needs future info from the solar prediction model, load demand prediction model and the current state of charge (SOC) of the battery to make planning for battery usage.

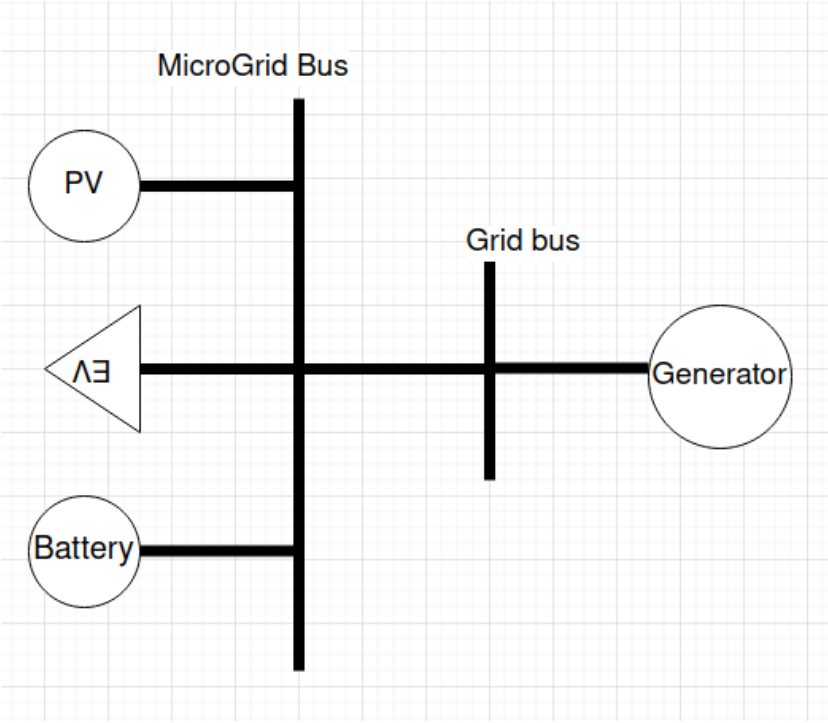

Figure 1: Network example.

Users can select between the predefined load and EV profile, figure 2 or upload their own data. The data should be in csv format, the data structure example in figure 3. In figure 3, The first column is the power generated by PV the second Colum is Electric vehicle charging profile. Press the "RUN DEMO" button and wait a bit for the system to calculate and plot the results, figure 4.

The PV power is defined as: PV_out = PV_in*Pnom.

- PV_out: PV power generated in Kw.
- PV_in: power per unit of Pnom.
- Pnom: 15 KW.

EV: Electric Vehicle charging in Kw.

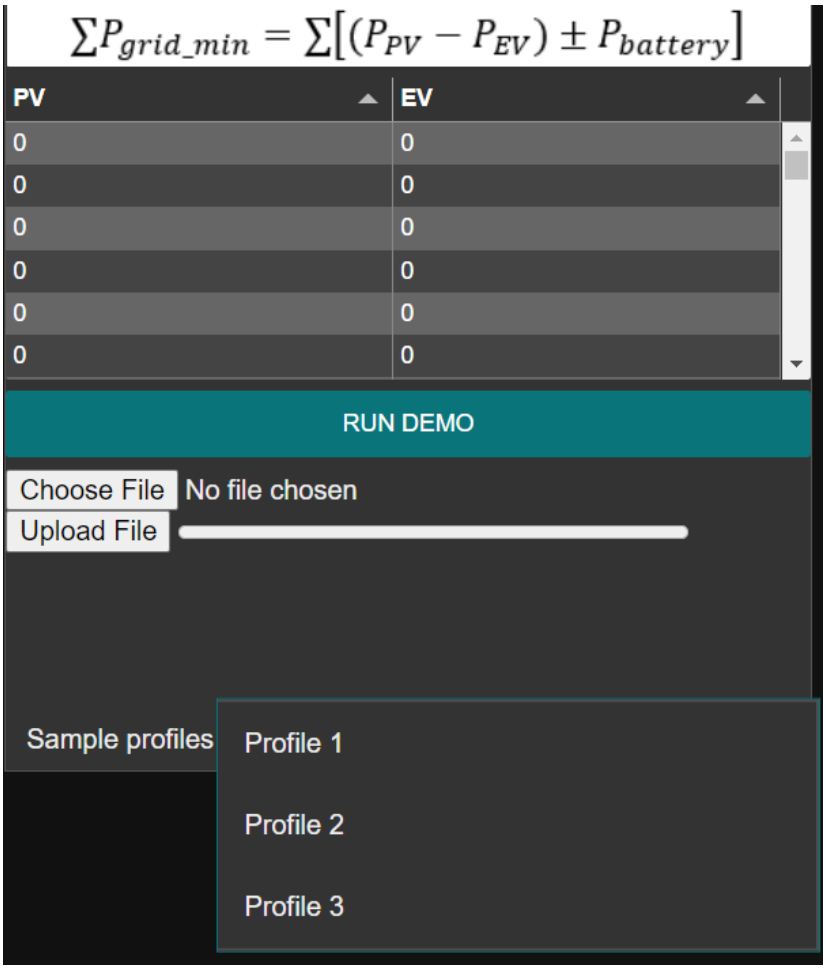

Figure 2: Select the predefined profile.

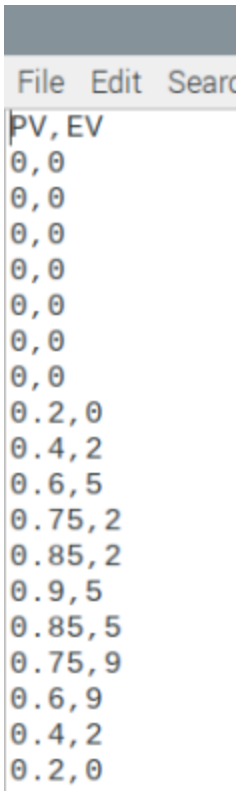

Figure 3: Example data structure.

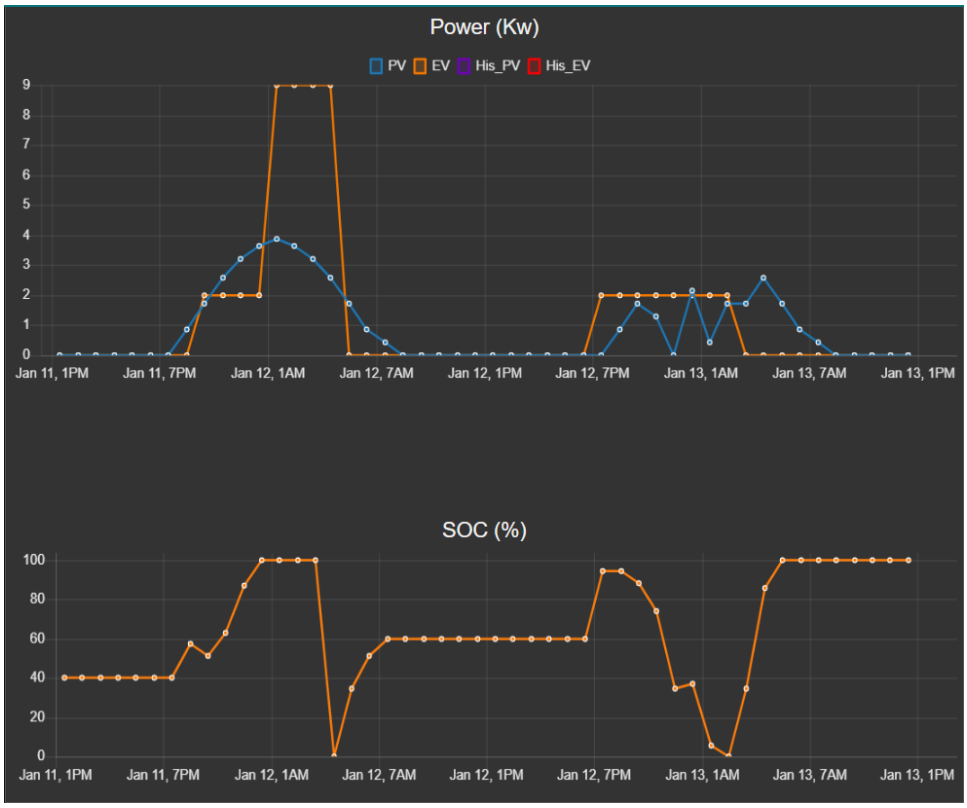

Figure 4: Example results on how the battery is used.