Solar lab

Activities kick off
08.02.22



Current problems

Solar lab current problems

➢ Discharge of the battery

Prob. Description : Even if the battery is full (20kWh) and the consumption very low (only the ventilation system), it will be empty in 1 or 2 days → top part of the battery unit has a very low efficiency

Current situation : The battery unit is always connected to the grid to add more power, if necessary

Aim : Use only the battery modules and disconnect the top part which is use as an inverter right now

Next steps : Understand why the top part of the battery has such a low efficiency

Solar lab current problems

➢ Internet connection

Prob. Description : Internet connection is at a low intensity. Computer and CCA are currently connected and working, but there won't be enough intensity for AC devices

Risk : Data loss (Tigo app works with internet)

Next steps : Find a way to increase internet intensity

Solar lab current problems

➢ **Low energy production *(difference between theoretical and real energy production)***

Prob. Description : Solar panels energy production is much lower than expected (see below graph)

- Real production like theoretical one during sunny days
- Real production near to zero during December

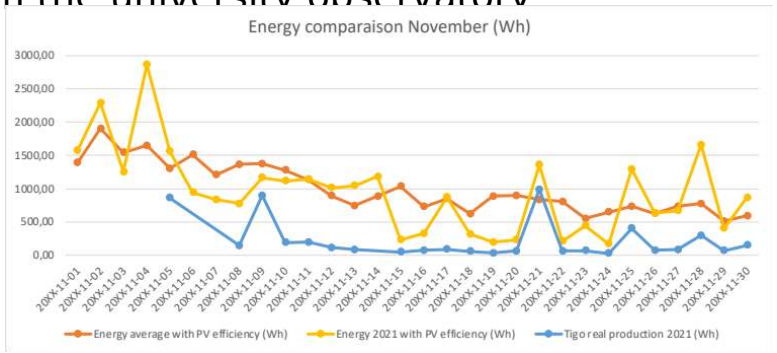
→ Theoretical energy production was calculated with Bergen radiation datas from the university observatory

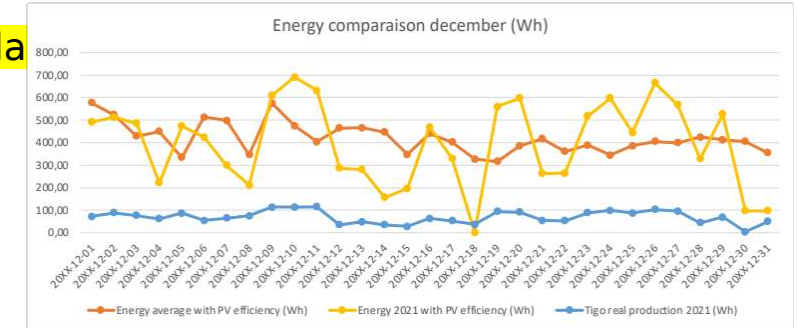
Hypothesis :

- Solar panels efficiency is not at a 100%
    - Random solar panels transforms only 15% of the radiation received in electricity

Next steps :

- Understand how the theoretical energy production was calculated
- Search for the efficiency of the solar panels in the passive house
- Recalculate the theoretical energy production with efficiency datas of the sola
- Do the comparison for January month





Next activities

Sunny Island

- Receive the components and decide where to place them
- An electrician will come and connect everything
- Generator must be limited (see settings)

Logo update and panels display

Logo :

- Add the name of the university (Norwegian + English) → Underneath so it can be changed easily
- Install logos on the house + name of the university

Panels :

- Create posters explaining the role of the components and how they work together
- Create a kind of “free open show” where students can freely outside the house to read explanations about the installation
- TV on which you can see the information from the installation through the window, motion sensor

Electric car charging and vice versa

- Example : Hyundai, KIA
- Bi-directional box needed

Laboratory exercise for students

- Calculate the efficiency of a solar panel
- Calculate the power production of a solar panel
    - Collect the surface temperature, the current tension and intensity and the electrical resistance.
      Then calculate the power and efficiency of the panels. Compare the results with real data from Tygo app.

Own installation to measure radiation