Artefact Development Sprint Plan

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1 Description of Artefact

My artefact consists of data I collect and the scenarios I create. For my data collection I'll be using OpenWeatherMap API to collect forecast data of 7 days of Waurn Ponds. The whole description of my data collection procedure is provided in the next section. The scenarios I'll run simulations for are provided in my literature review under, Scenarios for Microgrid Simulations. Here's a simple diagram of my microgrid and its essential features.

An essential feature of this design is the storage facility i.e. the Battery.The Microgrid powers its electricity through Solar Energy Generation. During the day the sun looms over the location and is converted into energy through the solar panels installed. There are various scenarios during the day when the solar energy generation is interrupted. The weather could either be cloudy or it might be raining. In some scenarios, there might be a small ray of light emitting during rainfall. These scenarios need to be taken in mind and must be made aware to the battery.

The solar energy generation is at its peak during noon, when the sun is at the center. The generation gradually narrows down as the progresses. Scenarios such as solar energy generation during evening must also be considered. Just to be clear, there's no solar energy generation when its dark during night time. Another specific scenario can be solar generation at early dawn.

These scenarios are very essential and the battery must be made aware of such situations. The battery must be able to make its own decisions and be aware on when to consume energy and when to store it. To achieve this, I'll be coding these scenarios on C Sharp and the results will be provided in the Results section.

2 Relevance of Artefact

The aim of my project is to discuss about Microgrids and define different scenarios occurring in the microgrid. To get a better idea about the microgrid, I'm going to create a virtual environment of a microgrid and simulate them. For the simulation to run successfully, I will have to collect data for each of the components I've used. and then run simulations of each scenario.

The scenarios created and data collected for the simulations are my artefact and are essential for running the simulations.

3 Evaluation of Artefact against Research Questions

As discussed in my Task 4.1, my research questions are

- What is a microgrid. Discuss its importance, popular trends, shortcomings in the current state-of-the-art design.
- Define different scenarios for microgrid and run those scenarios to find metrics of success for a microgrid.

My artefact will come in use for my second research question, as the simulation will give a better insight on how a microgrid operates. The energy generated, extra energy being stored, energy being consumed by each appliance will be depicted in the simulation.

4 Sprint 1 goals and Evaluation plan

Sprint 1 commences from Week 6 to Week 8. My goal for this sprint is to discuss about my artefact and learn about its different features. Microgrid simulations can be very tricky and difficult to implement without any prior knowledge. A microgrid has various sets of components and learning about those components may take some time. Using a resourceful storage system is important and with no knowledge will make it difficult to run the microgrid successfully.