**Q1 Enviro sensing HAT Concept [5]**

Our team has come up with the idea to design and build a portable torch with auto-adjusting brightness. This project is engineered specifically for the age of load-shedding we are currently in, and caters to all audiences with a niche target on students. The device is easily rechargeable, using a 5V input, it could be connected to a laptop or a car. The board also uses an LED display system to represent the battery level, so users can use it safely without fear of suddenly running out of power. The design will be sleek and compact so that it fits like any other tool in a mechanics hand. The product has the potential to include a timer, which can have various uses.

**Q2 Requirements [10]**

* **Scenario 1: Students**

Students can make use of this torch during times of loadshedding, when more light is required during studying.

**R1.1** The torch should be bright enough to light up a desk space

**R1.2** Battery power should last at least two hours as per standard loadshedding schedules

**R1.3** Should be able to recharge via regularly available USB cables.

* **Scenario 2: Miners**

Miners often go into deep shafts that can tend to get darker as you get further from a light source or the surface. It would be useful to have a torch in cases such as this.

**R2.1** The product should be portable, and perhaps attach to a helmet

**R2.2** Battery power should last long enough for working shifts

**R2.3** In the case that the torch is attached to the helmet, the switch should be easy to find and use.

* **Scenario 3: Mechanics**

Mechanics need to shine light in tight workspaces.

**R2.1** The product may need to be used as a headlight

**R2.2** Product should be compact enough to shine light in tight spaces.

**R2.3** Product should be robust considering its working environment

**Q3 Project Subsystems Block Diagram [5]**

