**Final Year Project Team**

**Meeting Minutes**

**December 11th, 2020**

The Project Team met in regular session on Friday December 11th, 2020 at 1:00pm. This meeting was held at the College of Engineering, Afe Babalola University, Ado-Ekiti, Ekiti State in B-29 lecture room.

**Project Members Present;**

* Professor Samuel.T.Wara, Project Supervisor
* Engineer Ibitoye, Project Supervisor
* Engineer Agunbiade, Project Supervisor
* Fejiro Ogunje, Overall Team leader
* Owolabi Oluwatomisin, Team leader
* Ndukwe Samuel, Technical Secretary
* Favour Ibekwe, Project Member
* Ozobokeme Oyinmiene Damian, Project Member
* Nornah-Awoh Annojoh-Nuywah, Project Member
* Kehinde Oluwatobi, Project Member
* Olatunbosun Treasure-Praise
* Engineer Peter.

**Absentees;**

* Engineer Oyebode, Project Supervisor

11 members were present, representing a quorum.

**Call to Order;**

The Project Supervisor, Prof. Wara Samuel called the meeting to order at 1:20pm.

**Open Issues;**

The meeting began with the Project Supervisor, Prof. Wara Samuel giving a presentation on the preparation of a system audit, pointing out the several segments to look into. These segments include;

* **Site Visit**;
  + Survey of the area.
  + Load /facility audit.
* **The scope of your work;**
* **Design Proper;**
  + CVE
  + Internal
  + External

**A table to be generated**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S/N** | **Device or item description** | **Quantity** | **Power rating (W)** | **Total Wattage (W)** | **Operating hours** | **Energy use (Watt/hr)** |
| 1 | Luminous (LED) | 10 | 5 | 50 | 8 | 400 |
| 2 | Water pump | 1 | 746 | 746 | 2 | 1492 |
| 3 | Portable devices | 10-20 | 5 | 50-100 | 8 | 400-800 |
| 4 | External Luminal | 10 | 10 | 100 | 10 | 1000 |
|  | **Total** |  |  |  |  | 3492Wh (3.5kWh) |

**Typical requirement for a solar powered system**

The Project supervisor also pointed out the typical requirements for a solar powered system;

* It should be a standalone system.
* It is going to be “OFF GRID”.
* It is going to be captive power.
* It is a mini grid.
* It is a micro-grid.

**Equipments involved**

He also looked into the considerable equipments. They include;

1. Solar Panels;
   1. Considering the type to use;
      1. Monocrystalline and,
      2. Polycrystalline.
   2. Considering the orientation of the panel’s materials to get the required output.
   3. Considering the location of the panel for better efficiency.
   4. Finally, considering the mounting method for the panel.
2. Charge Controllers.
3. Inverters (Pure sine wave inverter).
4. Batteries or other storage devices/units.

**Other accessories needed;**

1. Battery Rack
2. Solar Panel rack
3. Cables

Prof. Wara pointed out that the two major cons from the solar panel are ***Resilience and Continuity.***

* The Battery loss factor
* The Depth of charge (That is, How long the charge can really go).
* Nominal voltage of the battery ( That is, either 24 or 48)
* K-factor of 1.3 to provide an extra supply of about 30%.

He finally noted that the location determines the quality of your panel. The panel generator factor, in Nigeria it’s about 3.01.

**What are the things we are designing for?**

The Professor informed the project members to be interested in the things to design for. They are;

1. Total energy consumption (kWh).
2. Total Wattage of the load (kWh).
3. The energy consumption from the solar panel modules per day.
4. The total voltage of the solar panel capacity needed.
5. The number of solar panel modules to be used.
6. The inverter size in kW
7. Determine the battery bank capacity in Amps/hrs.
8. Determine the size of the solar charge controller
9. Decide the nominal size battery would be whether 24v or 48v.

**Bill of quantity**

The Prof. also pointed out how to generate a BILL OF QUANTITY.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| S/N | Component Identification | Technical specification(A/hr, V, W) | Quality | Estimated limit rate | Cost/date |

**Sample Calculations for the design process**

The project supervisor also pointed out some sample Calculation for the design process in groups of A, B, C and D;

Total wattage, W (A): 946-996 = approx. 1kW [i.e. equivalent to A/1000].

Total Energy use, W/hr (B): 3492 = approx. 3.5kWh [i.e. equivalent to B/1000].

The actual energy consumption needed for the DC module will be 1.3 times the total energy consumption

(C)= 1.3 x 3.5

Total panel capacity (D) = C/3.41 = (1.3 x 3.5)/3.41 = 1.33

The number of panels = D/Chosen panel rating = D/ (50/100/150/200/325)

**Sizing the Inverter**

Professor Wara also considered the sizing of the inverter. The size is in kW and are making about 25-30%,

kW + (25-30%) kW.

Inverter rating = (1.25-1.3)kW

**Battery Bank Capacity**

The prof. also pointed out to consider the battery bank capacity measured A/hrs. Talking about Ampacity which considers the capacity of the battery;

Energy consumption x the days of autonomy **/** the battery loss factor x the depth of discharge x the nominal battery voltage

**Size of the charge controller**

The size of the charge = 1.3 x the panel short circuit capacity, ISC

Specs of the Charge controller is located at the back of it. It contains, The ICS, Maximum Power, Maximum power voltage, Voc, Short circuit current, ISC.

The Project supervisor, Prof Wara also gave a briefing of the other sector of the project which is the **Control CVE** were it would be placed into 3 parts. PART A, PART B and PART C.

The PART A involves the requirements for the Hall which includes;

* Bottles
* Sand
* Laterite
* Cement
* Lining

The PART B involves the people that will be involved;

* Design team
* Finance team
* Audit team (EVERYONE)

Finally, the PART C involves just site security,

* Securing the parameters

**New issues;**

At the end of the enlightening presentation from Prof. Wara Samuel, Engr. Ibitoye gave a brief discussion with the project members and the project members were given a task to;

Provide the ratings of several devices that would be used in the community hall made like Clippers, TV, Decoder, etc.

The project members were also told to look for battery ratings for the solar system.

They were also told to draft a letter and to provide a total design for the two (2) sections of the project work.

The project members with Engineer Peter were also told to use the sample calculations for the design process to acquire the total wattage and total energy use for the newly acquired rating of the several devices that would be used in the community hall.

**Agenda for the next meeting;**

The project supervisor, Engineer Ibitoye stated to the project members to provide the Bill of Quantity and present it for reviewing with the appropriate calculations and ratings.

**Adjournment;**

Meeting was adjourned at 5:40pm by Engineer Ibitoye. The next general meeting has not been scheduled due to student’s vacation from school.

Minutes submitted by: Ndukwe Samuel

Approved by: Owolabi Oluwatomisin