

A VISIT TO VIKRAM SOLAR PLANT

Vikram Solar is an internationally acclaimed enterprise which specializes in manufacturing of **solar photovoltaic (PV) modules**. Since their inception in **2006**, they have gradually developed themselves to become one of the key players among **mono crystalline and multi crystalline module manufacturers**.

On **28th Feb'11** our college (St. Thomas' College Of Engineering and Technology) along with CIEM, Tollygunj participated in an industrial visit programme organized by IEEE, Women in Engineering ,Affinity Group, Kolkata to Vikram Solar Plant, held to display a practical application of solar PV modules and their manufacturing. The entire group from our college comprised of 10 students (5 each from electronics and electrical streams) and 13 from CIEM.

The major emphasis was led on the following points during the seminar:-

- 1. Requirement of Solar Energy.**
- 2. Role of Vikram Solar Plant in this field.**
- 3. Illustration with practical demonstration.**
- 4. Manufacturing process of the modules.**
- 5. Other products of daily use.**

1) Solar Energy:-

The sun is the ultimate form of energy. Now with the soaring fuel prices there is an utter need of an alternative. Tapping of solar power and it's further utilization is cost effective. Moreover the government has been taking initiatives to spread the awareness regarding development of solar power utilization systems.

Vikram Solar has put a step forward in this direction.

2) Role of Vikram Solar Plant:-

At **Vikram Solar**, they have tried to transform their vision in action. Their main aim is to foster innovation, build trust, and cater social responsibility. With these small goals they have achieved considerable success in the field of solar energy generation. Established in 2006, **Vikram Solar** is the latest addition to the glorious line up of companies under The **Vikram Group**. The main products of **Vikram Solar** is multi crystalline silicon photovoltaic modules which bear international certifications like UL, IEC, TUV and CE marks. Their operations are **ISO: 9001: 2008** certified with a constant endeavor to benchmark best operational practices in every aspect of the business.

3. Illustration with practical application:-

After the presentation the entire group was divided in two teams and they were sent to have a study of different sections of the plant. We first went to have a look into the practical generation, and implementation of solar energy in the lighting up of street lamps for the entire faculty. The entire set up can be described as follows:-

- **SOLAR MODULE**
- **SOLAR CHARGER CONTROLLER**
- **TUBULAR BATTERY**
- **POWER DELIVER**

1. SOLAR MODULE:-

Solar module is nothing but the combination of the Photovoltaic cells in series so that the entire excited electrons can be collected at a particular place and a requisite amount of voltage is developed across it. The different types of module generated in the plant are shown in the figure below:-



Fig:-1 Different modules at the plant

The difference in size of the modules is basically due to the difference in the voltage generated by the modules. These are basically of following types:-



1.

ELDORA 40



2.

ELDORA 80



3.

ELDORA 130



4.

ELDORA 200



5. ELDORA 230



6. ELDORA 270

Now based on the requirement the modules can be selected. At the site two Eldora 230 were utilized to supply power to the entire street lights all around the plant during the night hours.



Fig: 2 Street Light applications of solar modules

2. SOLAR CHARGE CONTROLLER:-

A solar charger controller is used before the charging current is fed to the battery. The charge controller basically controls the value of the charging current depending on the amount of charge stored in the battery.

3. TUBULAR BATTERY:-

Tubular battery is utilized for storing the charge generated by the solar module. The basic advantage of using a tubular battery over a normal flat-type is the large surface area provided by the former.



Fig:-3 Tubular Battery used for storing charge

4. POWER DELIVERY:-

Power generated at the site was employed to drive the street lights present across the faculty during the night hours.

4. MANUFACTURING PROCESS OF THE MODULES:-

The manufacturing process of the modules undergoes the following steps:-

- CELL TESTING
- STRINGING
- BUSSING
- LAMINATING
- FRAMING
- SUN STIMULATION
- FRAMING AND BOXING.
- PACKING.

A setup of the formation of the module is shown below:



Fig: 4 Formation of modules

5. OTHER PRODUCTS:-

After having a look into the formation of the modules and their practical applications we went to have a look at the different products manufactured for household purposes which consisted of solar lanterns, solar torches etc.

At the end of the day the entire event was a delightful experience for all of us as we got a chance to have a look into the things which will be quite necessary in our near future.

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