ELECTRICITY

The atoms are constituted by a central nucleus of neutrons and protons (with a positive charge) and by electrons (with a negative charge) wich move around the nucleus.

For the insulator materials is very difficult to remove the electrons, while for metal materials is very easy. For semiconductors the value is close to metal but a little higher.

When is applyed a different voltage at the ends of a metal cable the electrons move to a positive voltage.

The electricity is based on the flow of electrons moved by a Voltage difference. This flow of electrons throught the different electronics components generate heat (in resistor), movement (in rotors of motor), voice (in loud spekers) and transmission, reception and storage of data in electronics computers.

Electronics could be considered as a section of electricity but with very low level of current flow and low voltage differents, based on the conduction through semiconductors,
that has been invented in 1948 by William Shockley.

The electricity is a new form of energy against the previous one based on compressed vapor.

Before the use of electricity, mechanical equipment were powered by source of vapor at high temperature

which moved a turbine connected to axial or rotational elements.

The first form of electricity came from the exsperiments of Volta and it was in DC voltage.

This kind of voltage limited drastically the use of this form of energy for two aspect:

- the value of voltage (was difficult obtain very high value of voltage)
- from the first aspect came the second negative aspect related to the cost of trasferring the energy by cables wich needed bigh diameter to avoid thermal dissipation and drop of voltage along the line.

When was introduced the alternate voltage started the massive usage of electricity for powering all mechanical and termic equipments.

The cost of trasport of energy was reduced, increasing drastically the voltage.

In this way the diameter of cables is very small and the lost of energy is very low.

The electrical energy is produced by different structure of generator, traforming the potental energy or the thermal energy.

Idroelectrical central trasform the potential energy of water in cinetic energy and this energy moves the turbine that is connected to alternator wich give directly the AC Voltage.

Thermal energy is produced in different way as combustion of carbon,oil and nuclear reaction.
All the trhee form of energy heat the vapor that move the turbine.
The AC voltage from the central is increased by trasformer and is transferred to the lines.
At the second end of lines there is a trasformer that drop the voltage at the used value.
Normally 380 Volt AC with three phases.This voltage is normally used in industrial area.
Between a single phase and neutral connection there is the 220 Volt used for domestic needs.