



ELECTRIC GENERATION WITH RENEWABLE ENERGIES

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INTRODUCTION

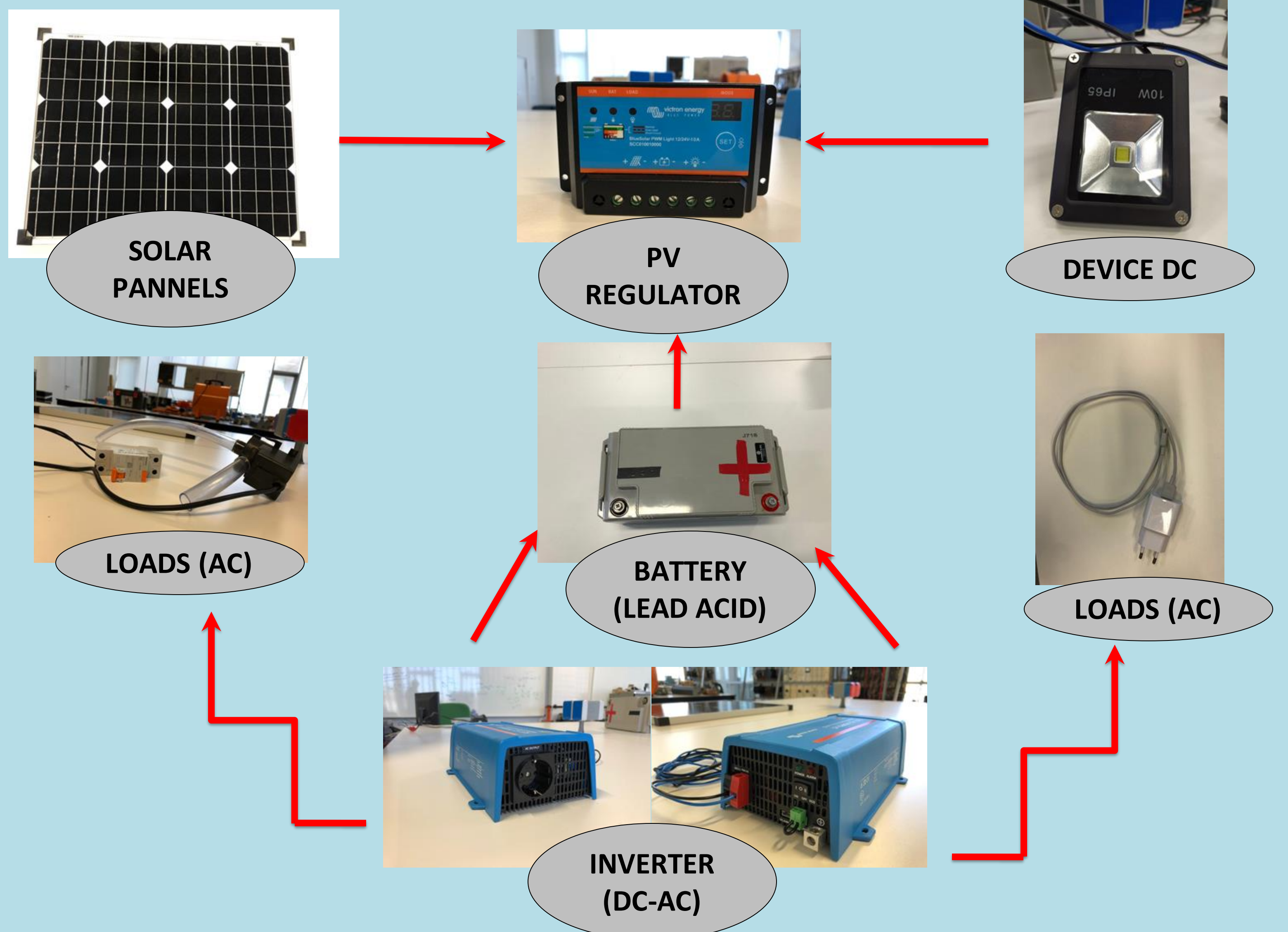
Due to the depletion of traditional energy sources, as petroleum, it is vital to obtain energy from other sources, like renewable energies. Consequently, our investigations analyse the suitability of photovoltaic energy to supply a basic electrical installation. The main advantage of renewable energy is that, contrary to fossil fuels, it almost never runs out and can be used perpetually. As a downside, it may be more expensive than other types, although it turns out more affordable in the long term.

MATERIALS AND METHODS

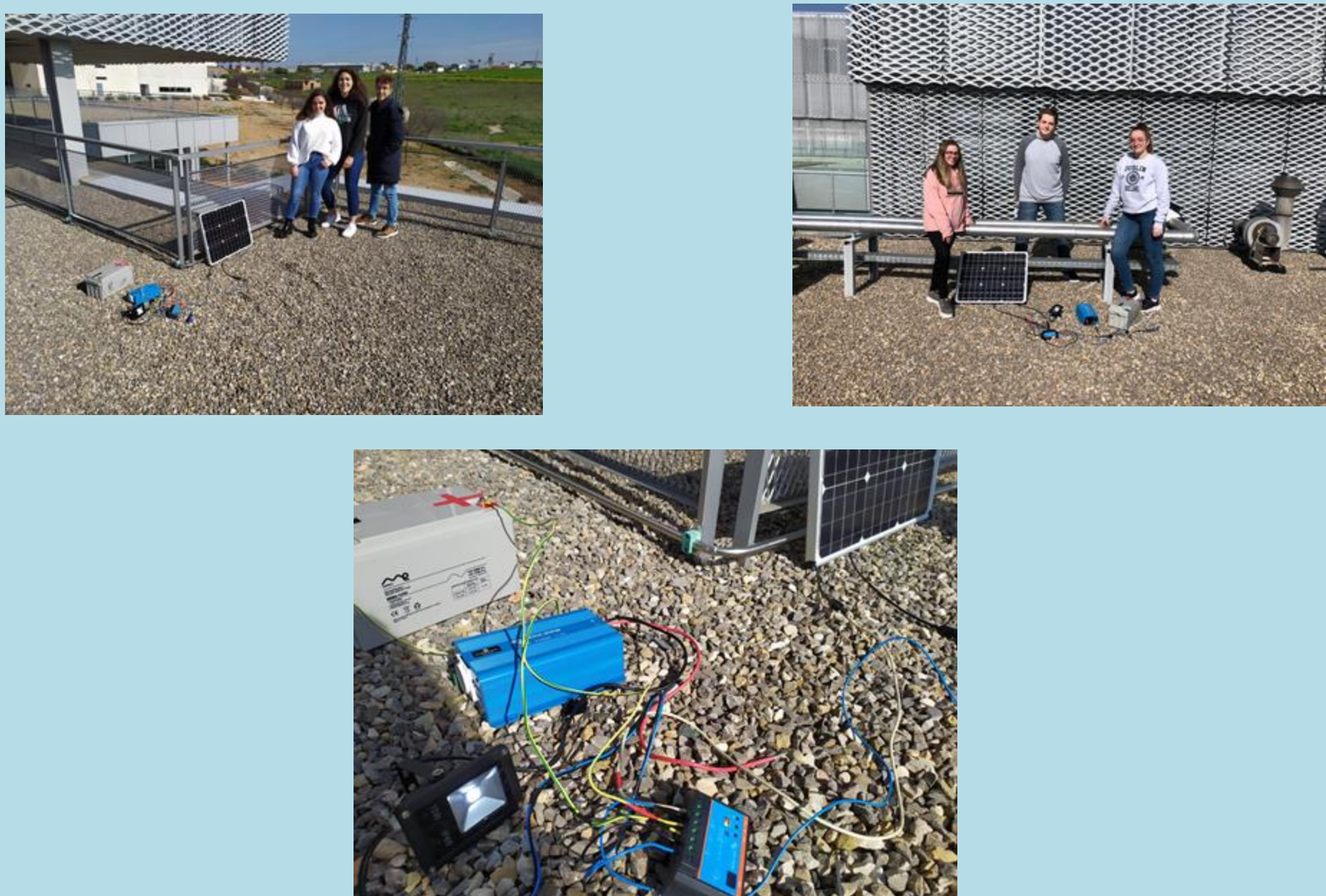
1. Study of a photovoltaic solar panel.



2. Preparation of the installation and system elements.



3. Connection scheme and devices of an autonomous photovoltaic system.



RESULTS

Electric devices	Nominal Power (W)	Cycle (h/day)	Electric energy (Wh / day)
LEDs	7-10	5	500
TV	150	3	450
Fridge	350	2.5	875
Laptop	100	4	400
Fan	80	4	320
Heater	450	3	1350
Other ones			200
Total			4095

$$P_{p,\min}(kW_p) = \frac{E_D \cdot G_{STD}}{G(\alpha, \beta) \cdot FS \cdot PR}$$

$P_{p,\min}$: solar panels to supply

E_D : solar energy per day

G_{std} : 100 W/m²

H : minimum energy per month

η_{loss} : is the product of two constants (FS and PR (Performance ratio)), whose values are 0.93 and 0.55

CONCLUSIONS

The main advantages of photovoltaic energies are:

- Lower electricity bills since the panels last between 20 and 25 years. The cost of purchase and installation get returned from 5 to 7 years.
- The use of this energy represents an eco-friendly form of consumption since it is not detrimental to the environment and it consumes very little.
- It is a way of renewable energy owing to the fact that it comes from an endless natural resource: sunlight.
- Systems are easy to install, as we have shown.
- The photovoltaic installation can be installed anywhere providing renewable energy during sunlight and with no pollution.

