



European Project Semester

PROJECT OUTLINE

Project dates: March 2019 - June 2019

Title: Automation of electrical self-consumption from solar panel energy sources - GREENERGY

Project activity areas:

Electrical engineering, automation, market research

Keywords:

Green energy, self-consumption, solar panel

Tutor's name and coordinates

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Project origin

Industrial

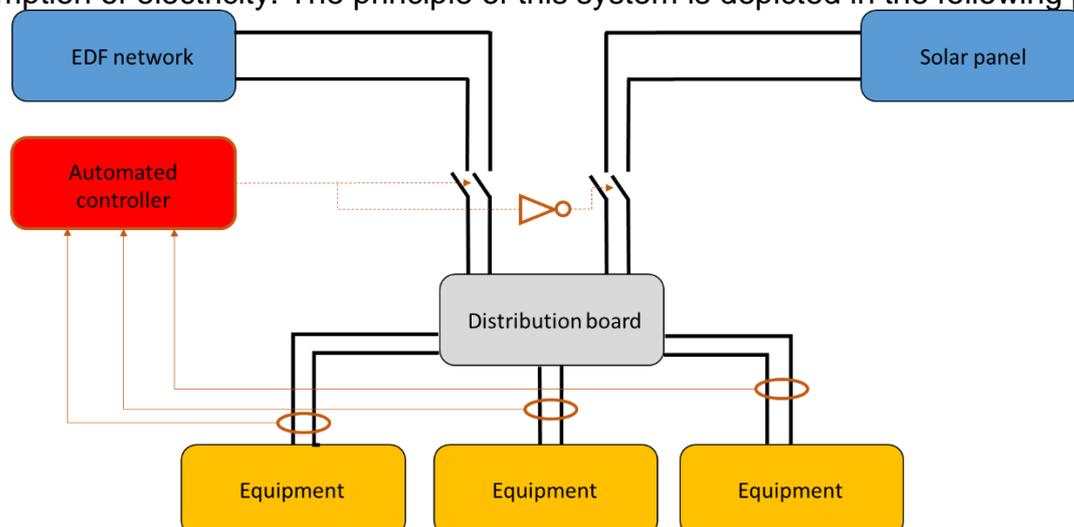
Project technical background:

Green energy, such as electricity produced by local wind turbines or solar panels, is obviously the future of energy production. In south of France, regarding the high insolation rate, more and more private individuals decide to set up solar panels on their roof to produce green electricity.

On the one hand, energy produced by solar panels set up by private individual is directly sold to EDF (French electricity producer) and injected on the global electricity network. On the other hand, the producer is also supplied by the network and buy electricity to EDF. Consequently, self-consumption is not really promoted.

In order to be more efficient, self-consumption has to be developed. Indeed, several equipments in houses such as television, computers, washing machines, etc, induce power consumption even in sleep-mode. Consequently, it becomes obvious that such equipments could be directly supplied by solar panels during the day.

The aim of this project is to study an automated system that could manage self-consumption of electricity. The principle of this system is depicted in the following picture:



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From measurements on the output lines of the distribution board, the automated system has to connect input to the main network, to solar panels or to both of them in order to favor as much as possible self-consumption from solar panels. Obviously, the proposed automated system has to be simple, reliable and as cheap as possible. For example, "intelligence" of the system could be implemented in an Arduino board or in a Raspberry Pi computer.

Studied topics:

Based on a needs analysis, functional analysis and a market study, the automated control system will be designed by students according to the needs and requirements expressed by potential customers. Based on simple materials, a prototype will be built as a feasibility proof.

Based on the generic description of the project, main deliverables are :

- 1) Complete requirement document. This requirement document must be usable for the client to design the final system.
- 2) Feasibility proof prototype
- 3) Intermediate and final report and presentation.

All these topics should be prepared and realized using a traceability and quality chart to allow further user designs.

As far as the background required, an overall curiosity for energy linked subjects is needed. A general understanding of electricity would help a lot. Depending on the student background, some subjects could be more developed for instance :

- For economy students, the focus will be done on the market study,
- For computing or control engineers, the focus will be given on the programming of the automated system,
- For electrical engineers, the focus will be given on measurements and control,
- For others, we will find together something suitable.