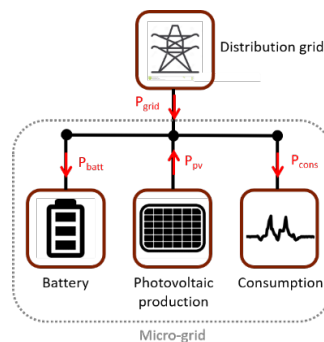


# Optimization of a microgrid based on renewable energy sources

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August 19, 2019



## Microgrid

A microgrid is a local electricity network that combines energy sources and loads and can be used at the house, building or neighbourhood scale. A microgrid may contain renewable energy source such as photovoltaic cells, but also batteries or chargers for electrical vehicles. Managing a microgrid involves making decisions about how best to handle energy flows between the sources, storage units, consumers and the main grid.

## The project

The goal of this project, during which the student will collaborate with an energy consultancy company, is the development of a mixed-integer programming model of such a microgrid. With real-world data provided by the firm, this model will be used to determine the optimal decisions the microgrid owner should make, and thus the possible financial gain they can expect from their grid.

This project is very hands-on and will give the student the chance to apply the knowledge gained in the Discrete Optimization course to an industrial problem. The student is expected to have good programming skills, to be proactive and highly motivated.

## Milestones

- Acquiring a good understanding of the industrial setting and problem
- Developing an appropriate mathematical model of the problem

- Implementing the model and solving it with a state-of-the-art commercial solver
- Producing experimental results, testing model variations

## **Prerequisites**

Basics in optimization, good programming skills, highly motivated, proactive mindset.