

# Opti TER



Component  
École Nationale  
Supérieure  
d'Électrotechnique  
d'Électronique

## In brief

- > **Ametys Code:** N9EE17D
- > **Open to exchange students:** Yes

## Presentation

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### Objectives

Implement methods for optimizing energy flows in an electrical microgrid.

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### Description

This TER illustrates optimization techniques (covered in the continuous optimization course N9EE17F and the linear programming course N9EE17E) using a concrete example. The proposed case study concerns a microgrid comprising photovoltaic energy production combined with a storage battery to supply a residential load (family home). The objective is to reduce the household's electricity costs by taking advantage of off-peak/peak pricing and exploiting the degree of freedom offered by storage. The proposed benchmark allows us to test different strategies for planning energy flows over 24 hours, based on expertise (heuristics, rule-based controls) or optimization techniques: gradient methods, geometric methods, stochastic metaheuristics (genetic algorithms, particle swarm optimization, simulated annealing) or mixed-variable linear programming (after linearization of the problem).

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### Pre-requisites

courses N9EE17F and N9EE17E