CIRED
PORTO, PORTUGAL
2– 3 JUNE 2022

1273 - Optimal Connection Phase Selection for Single-Phase Electrical Vehicle Chargers

Amina, Benzerga
ULiège, Belgium

Simon, Gérard
RESA, Belgium

Simon, Lachi
RESA, Belgium

Quentin, Garnier
RESA, Belgium

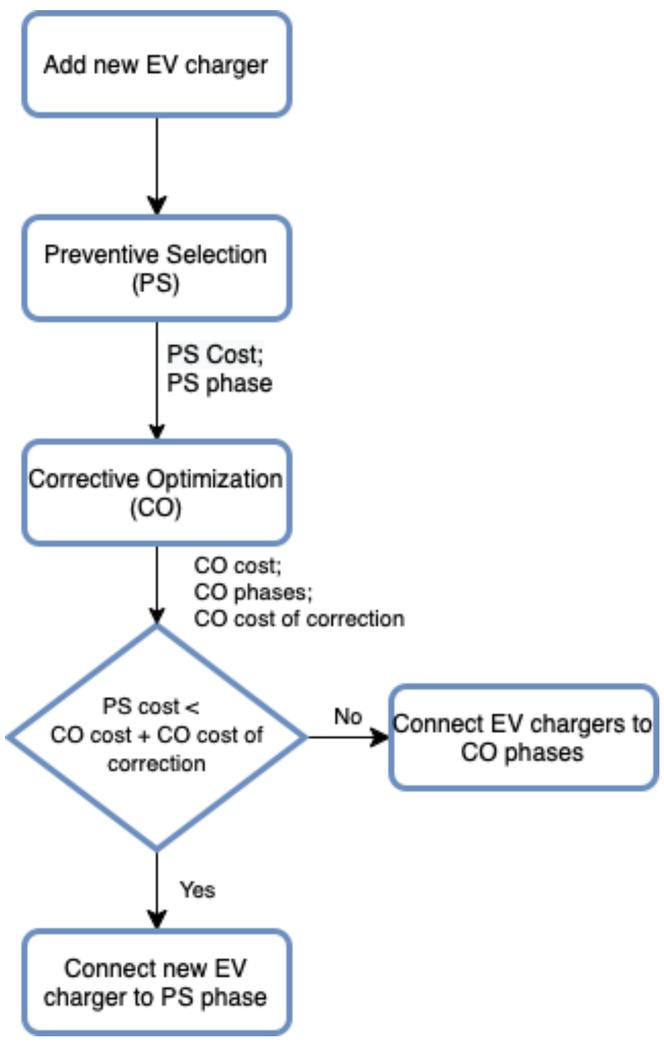
Alireza, Bahmanyar
ULiège, Belgium

Damien, Ernst
ULiège, Belgium

Introduction

- EVs connected to residential electricity networks are increasing drastically and may cause under-voltage issues in a near future.
- The aim is to lower the operational costs, and to increase the **network hosting capacity** for EVs, by finding the best connection phases for EV chargers.

Methodology



- **Preventive selection**

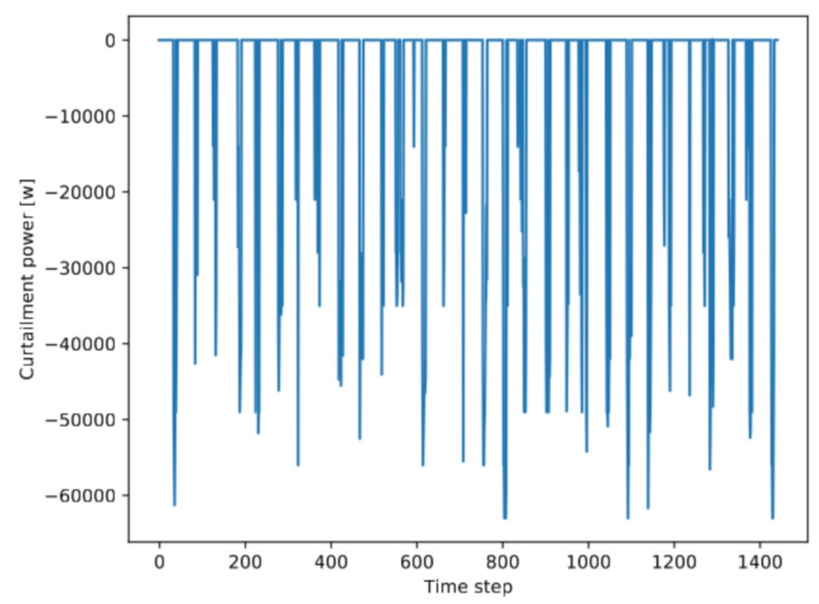
Choose connection phase of the new EV charger with smallest cost.

- **Corrective Optimization**

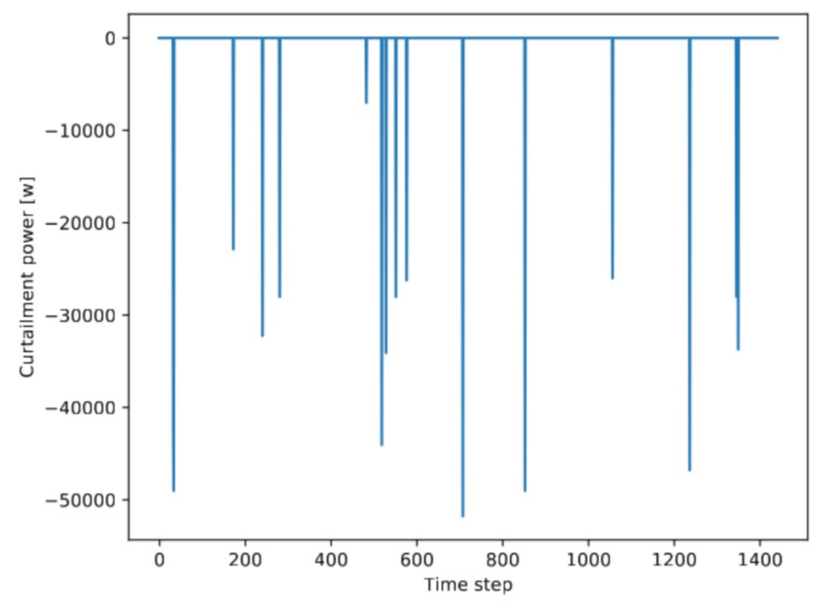
Choose the set of connection phases for all EV chargers that minimize the cost.

Results

The results obtained on a case study based on a **Belgian** low-voltage (**LV**) distribution network show how this simple optimal decision can help DSOs to decrease their operational costs by decreasing the under-voltage.



(a) Curtailment powers for 9 installations without CO



(b) Curtailment powers for 9 installations with CO

Simulation curtailment powers for 9 installations with and without CO.

Conclusions

The method is designed as a simple and **practical tool** for DSOs and it provides tangible actions to lower the costs with minimum effort.