

Master-Thesis:

Resilient operation of distribution grids with electric vehicles

Context:

Electric vehicles can act as an alternative power supply during contingencies. Moreover, they are mobile, allowing them to be dispatched to different places in the grid. It is in the interest of DSOs to implement functions that will leverage on the stored energy in electric vehicles during contingencies.

Your tasks:

First, the student will define scenarios where electric vehicles are used by households as a power supply during contingencies. The student will look for typical policies in literature for managing loads and resources during contingencies. Then, the student will implement a grid-level energy management system that will have two modes: normal operation and contingency operation. Here, typical household data and models of EVs have to be accounted for. The student will then evaluate how electric vehicles can improve system resiliency through the energy management system.

The electric vehicles and households have to be programmed in an agent-based way using Python. Skills in Python are also needed to run an existing software that produces synthetic grids.

Contact:

Wilbert Rey Tarnate
Tel. +49 241 80 49618
wtarnate@eonerc.rwth-aachen.de

ACS | Institute for Automation of Complex
Power Systems
ERC | E.ON Energy Research Center
RWTH Aachen University
Mathieustr. 6, 52074 Aachen, Germany