



# COTEVOS

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## Abstract

This Deliverable of the Task 1.4 describes the work done as well as the results that were obtained within the COTEVOS project in order to find a reference electricity network for interoperability testing. The Document describes a review of relevant other projects followed by a statistical analysis of multiple European low voltage grids on a feeder level. Based on this statistical analysis a recommendation for the generation of reference grids as well as an example implementation is given.

## Executive Summary

Within the Task 1.4 of the COTEVOS project a representative reference grid for interoperability tests between the grid and the EV/EVSE has been developed. This Deliverable describes the methods used and discusses the results of task 1.4 as well as it gives an example implementation of such a reference grid.

In order to be capable to execute representative interoperability tests between the grid and the EV/EVSE throughout all Europe the definition of a single reference grid is not sufficient, as the variety of European low voltage grids cannot be covered with a single grid. The distribution grid landscape of Europe is very diverse and versatile, in addition such a unique reference grid will most likely be defined by a set of parameters that represent either an absolute average grid or a single worst case scenario. Such a reference grid would clearly not reflect the variety of regions throughout Europe.

The versatility of needs that are applied on the COTEVOS reference grid, such as EV charging modes, fast charging, V2G applications, etc. result in different load behaviour of the EV/EVSE.

Based on ongoing and previous projects, an analysis of these project results was carried out. In a further step a statistical evaluation of 34 European grids of different grid topologies was done. It was based on 24 parameters which were based on previous work on network classification **Fehler! Verweisquelle konnte nicht gefunden werden.,Fehler! Verweisquelle konnte nicht gefunden werden.,Fehler! Verweisquelle konnte nicht gefunden werden..** The stochastic evaluation of these grids for the chosen parameters was done on a feeder level. Those parameters were then independently compared to stochastic distributions in order to be capable of providing a set of minimum, mean and maximum values.

Each parameters distribution was compared to multiple distribution curves in order to find a best fitting distribution that can be used to describe the parameters behaviour best. A table showing the minimum, maximum and mean values for each parameter as well as the best fitting distribution is given. Based on this table the specific generation of an independent reference grid for the evaluation of the interoperability between grid and EV/EVSE can be developed and used for versatile laboratory tests.

