

Innovation type:
Data set

TRL: 5

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Contact: Gerd Kjølle
gerd.kjolle@sintef.no

Target group:

Actor/ purpose	x
DSO, TSO	x
Technology provider	x
Member organisation	x
Market operator	x
Research/ Consultancy	x
Teaching	x

Reference MV distribution grid data sets

A reference data set for a representative Norwegian radial, medium voltage (MV) electricity distribution grid operated at 22 kV is established, the CINELDI MV reference system (or grid). Grid data from a real MV distribution grid are anonymised and adapted to establish reference grid data representative for Norwegian distribution grids; including topological data, load profiles, new types of loads, reliability data, and standardised component data.

Challenge

International academic test grid data sets are often not suitable for studying realistic problems. It is important to establish data sets representative for real distribution grids, enabling new technologies, scenarios, and solutions to be tested and validated in realistic environments. This allows for quantification of system level KPIs, for benchmarking, and supporting system innovation.

Solution

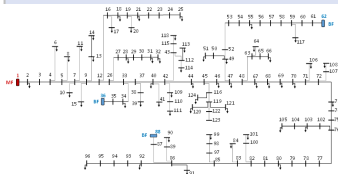
The first part of the data set describes the base version of the reference system that represents the present-day state of the grid, including information on topology, electrical parameters, and existing load points. The data set also comprises a load data set with load demand time series for a year with hourly resolution and scenarios for the possible long-term load development. These data describe an extended version of the reference system with information on possible new load points being added to the system in the future. A third part of the data set is data necessary for carrying out reliability of supply analyses.

Potential

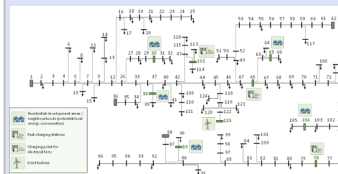
The reference grid can be used for assessing new methods and principles for distribution system operation and planning, including assessment of flexibility resources, active distribution grid measures, grid reinforcement planning, grid reinvestment planning, reliability of supply analysis, self-healing, etc.

Reference in CINELDI

- I. B. Sperstad, O. B. Fosso, S. H. Jakobsen, A. O. Eggen, J. H. Evenstuen, and G. Kjølle, "Reference data set for a Norwegian medium voltage power distribution system," Data in Brief, Vol. 47, April 2023, <https://doi.org/10.1016/j.dib.2023.109025>
- Data set available in Zenodo- repository: <https://doi.org/10.5281/zenodo.7133505>
- Some Python-code for processing and use of data set available on GitHub: https://github.com/SINTEF-Power-system-asset-management/CINELDI_MV_reference_system



CINELDI MV reference grid,
base version



CINELDI MV reference grid,
extended with new loads.