

Innovation type:  
Methods and tools

TRL: 4

Date: July 2020

Contact:  
Oddbjørn Gjerde  
[Oddbjorn.Gjerde@sintef.no](mailto:Oddbjorn.Gjerde@sintef.no)

Target group:

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

## Planning framework for active distribution grids

*A new framework for active distribution grid planning based on the traditional planning framework commonly used by Norwegian grid companies but that accounts for new uncertainties and possibilities in active distribution grids.*

### Challenge

The long-term planning frameworks currently used by electricity distribution grid companies are not designed to account for new challenges, more variability and new uncertainties due to e.g. variable distributed generation and electrification of transport. Together with new active grid operation technologies this calls for a new approach. Various advanced optimization methods for active grid measures are presented in the research literature, but they are rarely applied in a practical, long-term grid planning perspective. This makes it more challenging for distribution grid companies to employ such methods to assess costs, benefits and risks of active grid planning measures.

### Solution

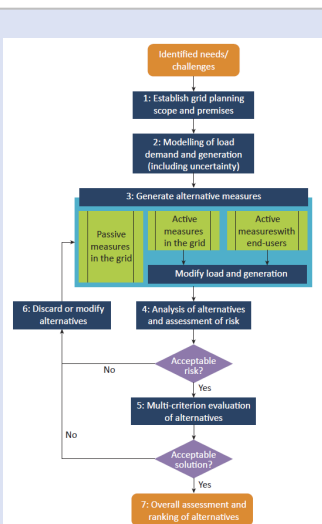
- Adaptation and extension of traditional grid planning framework in the Norwegian handbook on power system planning (Planboka) and active distribution grid planning framework by CIGRE WG C6.19.
- A framework explicitly accounting for active grid planning measures, structured in seven steps.
- Other innovative elements compared to the traditional framework include more detailed modelling of the variability and uncertainty in load and generation, and probabilistic and multi-criteria analysis of the measures.
- Overview and examples of relevant methodology that can be incorporated for each of the steps.

### Potential

- Allows for active grid measures and related technologies to be considered more consistently in distribution system development.
- Is a starting point for specifying requirements for methods and models to be incorporated in future planning tools for active distribution grids.

### Reference in CINELDI

I. B. Sperstad, E. Solvang, and O. Gjerde, "[Framework and methodology for active distribution grid planning in Norway](#)". PMAPS 2020



*Schematic grid planning process in the proposed framework.*