

INTERPLAN

PRESS RELEASE

EU research project INTERPLAN presents final results

INTERPLAN project develops an integrated operation planning tool towards the pan-European network, with a focus on the TSO-DSO interfaces to support the EU in reaching the expected low-carbon targets, while maintaining network security and reliability.

Kassel, Germany, 11 February 2021. EU-funded Horizon2020 project INTERPLAN (INTEgrated opeRation PLAnning tool towards the Pan-European Network, Grant Agreement No. 773708) is coming to an end after more than three years. During this time, the consortium has been working in close cooperation with the project main stakeholders to look at the potential operation challenges which TSOs and DSOs are called to address in the 2030+ power system. Indeed, the ongoing deployment of the pan-European network strongly depends on different potential scenarios related to the RES share in generation and installed capacity, as well as penetration of emerging technologies, such as storage and demand response. These factors bring new challenges for the energy system, which will outline the key operational needs of the European grid operators in the near future.

INTERPLAN developed an integrated operation planning tool for the pan-European grid, defined as a methodology consisting of a set of functions (grid equivalents, control functions) for grid operation planning. It addresses a significant number of grid operation planning challenges of the current and the future 2030+ EU power grid from the perspective of the transmission grid, the distribution grid, and with a particular focus on the transmission-distribution interface. The developed tool's functionalities are based on established commercially available products such as Python and PowerFactory, widely used by the industry and academia, and as such readily available for immediate adoption, implementation and further research activities.

About

INTERPLAN is a H2020 project that provides an INTEgrated opeRation PLANning tool for the pan-European network in order to support the EU in reaching the expected low-carbon targets while maintaining network security. INTERPLAN develops a methodology of a clustered model of the pan-European electricity network with the aim to generate grid equivalents as a growing library. By addressing operational issues at all network levels (transmission, distribution and TSOs-DSOs interfaces), this set of data will cover all relevant system connectivity possibilities occurring in the real grid.



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In more detail, the project results consist of:

- The integrated grid operation planning tool
- The embedded control functions in the use cases of the tool
- The analysis of grid codes
- The grid clustering and equivalententing method
- Further developments of the OpSim co-simulation tool

The INTERPLAN tool offers the possibility to investigate all grid voltage levels for operational planning purposes, and allows integrating the actions made by TSOs and DSOs, which are considered as the primary users of the tool. Moreover, the possibility to address a number of operational challenges of the current and future 2030+ power grids from the perspective of different grid operators is given by the control functions embedded within INTERPLAN use cases (UCs) and showcases (SCs). INTERPLAN use cases address very specific operational challenges that grid operators may face in the presence of high penetration of RES and emerging technologies. The INTERPLAN use cases look beyond the current regulations and grid codes, and propose solutions to face the challenges arising from high shares of RES and other emerging technologies.

In the context of grid codes and regulation analysis, different activities were performed. An extensive review of the existing grid codes related to emerging technologies was realised. This report formulates a baseline for spotting the omissions or barriers of national and EU regulations hindering the energy transition and the emerging technologies integration. Additionally, the consortium prepared a report of recommendations on the grid codes at national level, including lessons learned and best practice examples on codes and regulations.

During the equivalententing process, a large and branched part of the grid can be substituted by a relevant simplified counterpart, while keeping grid characteristics at an appropriate level of accuracy. This will reduce an important number of calculations and greatly increase the model simulation speed. Generating and using grid equivalents instead of the detailed model has thereby a great practical significance, and the grid equivalents can be convenient for different power system applications. INTERPLAN has developed a comprehensive methodology for grid clustering. In order to define the grid equivalents, a mapping of the requirements for grid equivalents for the developed INTERPLAN use cases and showcases was done by the project partners. Based on the identified requirements, an approach to generate simplified grid equivalents representing the original networks according to the required granularity by the individual use cases was established and developed.

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The OpSim co-simulation platform, which was developed by Fraunhofer IEE and University of Kassel in previous projects, was used and enhanced in INTERPLAN as one option for the validation of controllers, especially with regard to the combination of control algorithms in showcases. INTERPLAN is one example case of using OpSim as a service, which is a way to interconnect sub-simulations running at different locations over remote communication. Furthermore, an extended and simplified scheme for partly automated definition of simulation scenarios for INTERPLAN was developed. The new scheme uses a single Excel file as main means of definition, as well as a central SQL database for organizing scenarios and storing results. This is one approach for organizing a high number of simulation scenarios and may be used in coming projects and applications.

More about the project and its results at <https://interplan-project.eu/>

Project partners:



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