Web Consultation – 2050 Scenario data

FlexPlan project aims at creating an innovative grid-planning tool and validate it through six different regional cases in Europe and considering three target years: 2030, 2040 and 2050. These cases include:
- Iberian Peninsula
- France and Benelux
- Germany, Switzerland and Austria
- Italy
- Balkan Countries
- Nordic Countries

These regional cases represent comprehensive and complex simulation environments, considering heterogeneous data from multiple sources. Most relevant data sets needed to execute each regional case development include:

- Transmission (georeferenced) and distribution grid models using realistic electrical parameters
- Scenarios data to be simulated, using three different targets years and three scenarios based on ENTSO-E TYNDP 2020. These scenarios include renewable generation and load time series
- Dispatchable generation data, including generation costs and thermal power plants characteristics (for environmental impact studies)
- Technical and economical characterization of grid expansion candidates

Currently ongoing activities are focused in the creation/refinement of grid models and adaptation of scenarios to be simulated. The scenarios data is available at regional level on a first stage, and is then cascaded to grid nodal level in a second stage. Furthermore, the simulations include not only the three base scenarios, which are obtained and further adapted from ENTSO-E's Ten-Year Network Development Plan 2020 but also Monte Carlo variants of these, allowing to have a broader set of simulations and consider climate-driven variability in time series of renewable generation (also including hydro variations). The scenario creation methodology and exemplary obtained data was already published by FlexPlan in Deliverable 4.1[1].

The next steps to be executed in the regional cases, now starting, include running an Optimal Power Flow algorithm with dispatching cost optimization on non-expanded scenarios to allow an identification of grid expansion needs. Based on these grid expansion needs, a comprehensive list of expansion candidates will be created by a pre-processor tool and these candidates are evaluated taking into account a complete Cost Benefit Analysis. These candidates include traditional expansion measures and flexibility related solutions (storage and Demand Response - DR), which are in direct competition. The identified flexibility sources are fully characterized and the methodological procedure for their modelling is included in Deliverable D2.2[2].

In order to correctly evaluate all grid expansion candidates and achieve realistic and accurate results, these need to be fully characterized. In order to achieve this characterization, both from the technical and

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[1] FlexPlan Project, Deliverable D4.1 – Pan-European scenario data, 2020. Available at: https://flexplan-project.eu/wp-content/uploads/2020/08/D4.1_20200803_V1.pdf

[2] FlexPlan Proejct, Deliverable D2.2 - Flexibility elements identification and characterization. Available at: https://flexplan-project.eu/wp-content/uploads/2020/06/D2.2_20200622_V1.0.pdf

economical viewpoints, the FlexPlan team needs to collect representative data sets that allow performing this action. In this context, this web consultation aims to receive feedback from FlexPlan external stakeholders on existing data sources and relevant studies in this area that can contribute to this characterization and modelling process, contributing directly to the successful outcomes of the project. The answers which will be provided to the following set of questions will be used to improve the scenario inputs and, thus, will significantly contribute to the quality of the obtained simulation results.

- Which relevant studies can be used as data sources to characterize costs (CAPEX and OPEX) required to evaluate flexibility candidates (including DR, RES curtailment, battery storage, and others) at European level?
- Particularly for DR, which studies contain operational level data or at least highly reliable research level data for technical characterization (max amount of load shift, typical period of the day when the action is allowed, flexibility deactivation maximum period)?
- Which relevant studies can be used as data sources including CAPEX+OPEX costs related to typical grid expansion measures at European level? This is particularly relevant for our long-time scenarios (2050) for which TYNDP2020 does not contain any data.
- Should the regional cases follow a common approach using EU level averaged costs or should there be an effort to adapt these costs to national level ones? If yes, which other parameters are required and should be used as main inputs for this adaptation?
- What locational constraints should be considered in constructing BESS systems, hydrogen, pumped hydro and other storage systems?