



Web Consultation – 2050 Scenario data

The 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

The selected regional cases represent a multitude of different conditions including very heterogeneous grids, different weather conditions and grid characteristics, answering to different planning challenges such as renewables integration (wind, solar, other), de-icing measures or extreme temperatures operation, different grid topologies and geographic characteristics, among other. The usage of these use cases will allow a thorough validation of the proposed innovative planning methodology as well as the formulation of regulatory guidelines to the advantage of the National Regulatory Authorities. The regional cases are being created using a two-step approach: in a first step pan-EU energy scenarios are provided. In a second phase, these scenario data are scaled down to country/region level by using a market and grid simulation tool from TU Dortmund named MILES. The electricity market simulation module of MILES determines consistent boundary conditions for the individual regional cases.¹ The regionalization method calculates the spatial distribution of load and feed-in time series.² Realistic topological information from transmission and distribution grids is considered together with other additional sources for geographical and weather information.

Regarding the policy scenarios, which constitute the base for the creation of the FlexPlan pan-EU scenarios, the team decided to directly use the three storylines created by ENTSO-E and ENTSO-G (ENTSOs) and released as part of TYNDP2020³, named i) Global Ambition, ii) Distributed Energy and iii) National Trends. These three storylines were selected by the ENTSOs following a consultation of stakeholders evolving into TYNDP2020 scenarios⁴. In summary, the three scenarios have the following characteristics:

- **National Trends:** central policy scenario of TYNDP2020, it was designed to reflect the National Energy and Climate Plans (NECPs) created by EU member states, in line with the requirements to meet the European Union 2030 energy strategy targets.
- **Global Ambition and Distributed Energy:** these scenarios are aligned with COP21 targets and use either a centralized or decentralized approach to reach net-zero emissions at EU level by 2050.

¹ C. Spieker, J. Teuwsen, V. Liebenau, S. C. Müller, and C. Rehtanz, European Electricity Market Simulation for Future Scenarios with High Renewable Energy Production, in *2015 IEEE Eindhoven PowerTech*, Eindhoven, Netherlands, June 2015, pp. 1-6.

² J. Teuwsen, V. Liebenau, and C. Rehtanz, Comparison of regionalization methods for network development planning, in *4th IEEE PES Innovative Smart Grid Technologies Europe*, Copenhagen, Denmark, Oct. 2013

³ <https://www.entsoe-tyndp2020-scenarios.eu/>

⁴ https://docstore.entsoe.eu/Documents/Scenarios/190408_WGSB_Scenario%20Building%202020_Final%20Storyline%20Report.pdf



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The objective of FlexPlan is to use as much as possible these three scenarios as the source of input data for the project scenarios, as these were created by ENTSOs and received the feedback from multiple stakeholders including the European Commission and ACER⁴. However, current public available data for TYNDP2020 scenarios only consider the timeframes of 2030 and 2040, leaving a gap for the data to be used for 2050. Thus, a strategy needs to be formulated to populate the corresponding 2050 scenario data, at country level, to create the FlexPlan pan-EU scenarios for this year. Considering this, the following questions are to be considered: