D4.1 Specifications of the most adequate options for flexibility markets and RES support schemes to be studied in a cross-border context

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EXECUTIVE SUMMARY

The present D4.1 report provides the detailed specifications of the studies that will be performed within Market4RES WP4 with the OPTIMATE prototype simulation platform to analyse and compare selected short-term electricity market architecture options based on quantitative indicators relying on the three pillars of the European energy policy (economic efficiency, Security of Supply, Sustainability).

In a nutshell the methodology that will be used to compare and market architecture options is a sequence of four steps: the *Inputs* of the process, which consist in the elaboration of representative scenarios[1] and the choice of a range of market design options to be studied; the *Core*, namely the use of the OPTIMATE tool to perform simulations; the *Outputs*, i.e. the analysis of the results of the simulations based on standard quantified indicators; the *Scope*, namely the analysis of the impacts of the OPTIMATE modelling assumptions on the results as well as other qualitative issues not measured by the simulator. The implementation of this methodology will lead on to first policy recommendations. The present document is focused on the first step of this methodology (Inputs) and its related tasks. It also provides insights about the indicators that will be studied for each set of scenarios and market architecture options.

Due to the prototype nature of the tool, Market4RES WP4 studies will focus on the Day-Ahead processes. In this framework, two main studies will be performed:

- The impacts on the day-ahead market outcomes of different RES support schemes, including Feed-in-Tariffs and Price Premium, will be assessed;
- The impacts on the day-ahead market outcomes of large-scale deployment of demand flexibility will be assessed.

The above-mentioned short–term market architectures will be tested under three representative scenarios, with different renewable energy penetration levels:

- 2013 scenario: This reference scenario mimics the current situation, notably in terms of renewable penetration.
- 2020 standard scenario: This scenario represents what can be reasonably expected at 2020, based on official publications.
- 2020 RES+ scenario: This alternative 2020 scenario represents a more optimistic (contrasted but still realistic) situation in terms of renewable penetration.

For each of the three scenarios, a default OPTIMATE case will be run, which will provide a starting point from which variational studies, covering the two above-mentioned types of market architecture options, will be performed. In total, nine OPTIMATE cases will be run, covering the three scenarios and the two types of market architecture options. Each case will be run over selected

[1]Scenarios are sets of coherent data describing the initial state of the European system and consistent with a reference equilibrium of the market

periods of the year covering different seasons (for instance one winter month, one summer month and one mid-season month). Hence, in total, OPTIMATE simulations will be run over around twenty-seven case variants.

The geographical scope foreseen for the Market4RES WP4 studies covers the following countries: Austria, Belgium, France, Germany, Great-Britain, Italy, Luxembourg, Netherlands, Portugal, Spain and Switzerland, which covers 76% of the total consumption of the European Union and Switzerland.