



PlanGridEV

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“Future Scenarios”

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Main author	Stefan Übermasser (AIT) Sawsan Henein (AIT) Johannes Stöckl (AIT) Johannes Kathan (AIT)
Editors	Dr. Armin Gaul, Stefan Greve
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Future Scenarios

The overall objective of PlanGridEV is to develop new network planning tools and methods for European DSOs for an optimized large-scale roll-out of electro mobility in Europe whilst at the same time maximizing the potential of DER integration. The prototype of the tool to be developed in WP4 will need a set of use cases to be validated.

Several road maps and strategies for the European area have been analyzed. The developed PlanGridEV scenarios distinguish different use cases which derive from the two considered grid voltage levels (LV and MV), the five OEM scenarios and the business scenarios from WP2. Additionally, for the testing and validation process, a basic scenario was introduced for being used as reference scenario. Based on the case, where the individual hosting capacity of a given grid is at 100%, additional capacities of RES can be introduced for creating critical situations for challenging the optimization process of the prototype tool. The allocation of RES, EVS and charging infrastructure is following the findings of existing roll-out scenarios, current grid situations and previous project results. In the case of RES, at LV level, 100% will be PV systems, whilst at MV level, more than half of the generation of electricity is considered to be from wind turbines, followed by PV and CHP systems.

For the conventional and the safe scenario, it is assumed, that concerning the EV market penetration, the lower and rather pessimistic forecasts and roll-out scenarios apply (around 20% in total). This also applies for the technological development of the vehicles, wherefore the average battery capacity is considered to stay below 30 kWh. Additionally, for these two scenarios, the availability of charging infrastructure in terms of location is considered to stay at a similar ratio as it is today (mainly home and public charging stations). Private charging stations (at home locations) are assumed to provide a maximum of charging power up to 11kW on three phases, whilst charging at other locations is allowed up to 43kW AC or 50kW DC.

The Proactive and Smart Grid scenarios are expected to meet the optimistic outlook on EVs market penetration (around 40% in total) and their technical development (average battery capacities up to 40 kWh). The availability of charging infrastructure is considered to be mainly focused on semi-public locations (~80% semi-public, private and public stations ~10% each). Besides the charging mode on/off for the proactive scenario, bidirectional charging of EVs is considered to be available for the Smart Grid business scenario.