Guidelines for Distribution System Operators on Reactive Power Provision by Electric Vehicles in Low Voltage Grids

The increasing success of electric vehicles is bringing new technical challenges to power system operators. This work intends to provide guidelines for distribution system operators in terms of reactive power requirements when evaluating and authorizing electric vehicles supply equipment with fast charging capability in existing low voltage distribution feeders. The aim is to prevent the voltage to exceed the permitted values when charging at high power, by exploiting the effect of the reactive power. The proposed guidelines for distribution system operators are reported in a matrix, which indicates the amount of reactive power that an individual electric vehicle is expected to provide when connected to a low voltage feeder, in order to benefit of the desired voltage rise effect in comparison to the case of unitary power factor.

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