Nomenclature

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| *Indices and sets* | |
|  | Set of time intervals |
|  | Horizon; if 1, variable is within optimization horizon, if 2, variable is part of the next horizon |
|  | Segment of inverter’s linearization curve; |

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| *Parameters* | |
|  | Length of time intervals (h) |
|  | Forecasted market prices (€/Wh) |
|  | Forecasted feedin tariffs (€/Wh) |
|  | Forecasted PV plant generation (W) |
|  | Maximum power injection/absorption at the point of common coupling (W) |
|  | Constant charging efficiency () |
|  | Constant discharging efficiency () |
|  | BESS maximum charging power (inverters’ limits) (VA) |
|  | BESS maximum discharging power (inverters’ limits) (VA) |
|  | BESS maximum active charging power (batteries’ limits) (W) |
|  | BESS maximum active discharging power (batteries’ limits) (W) |
|  | BESS initial energy content (Wh) |
|  | BESS maximum energy content (Wh) |
|  | BESS minimum energy content (Wh) |
|  | BESS degradation curve linearization slope |
|  | Forecasted inflexible load assets demand (W) |
|  | BESS C-rate versus energy fraction discharge curve linearization slope, normalized by the nominal discharge voltage (h) |
|  | BESS C-rate versus energy fraction discharge curve linearization origin (Wh) |
|  | BESS C-rate versus energy fraction charge curve linearization slope, normalized by the nominal charge voltage (h) |
|  | BESS C-rate versus energy fraction charge curve linearization origin (Wh) |
|  | Battery (charge) power versus power times efficiency curve linearization slope |
|  | Battery (charge) power versus power times efficiency curve linearization origin |
|  | Battery (discharge) power versus power times efficiency curve linearization slope |
|  | Battery (discharge) power versus power times efficiency curve linearization origin |
|  | BESS minimum charging power (inverters’ limits) (VA) |
|  | BESS minimum discharging power (inverters’ limits) (VA) |
|  | A very large positive number (e.g. 1E9) |

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| *Variables* | |
|  | Active power absorption at PCC (W) |
|  | Active power injection at PCC (W) |
|  | BESS charging active power set point at AC side (W) |
|  | BESS discharging active power set point at AC side (W) |
|  | Auxiliary binary variable for non-simultaneity of inverse flows at BESS |
|  | Auxiliary binary variable for non-simultaneity of inverse flows at PCC |
|  | BESS energy content (Wh) |
|  | BESS degraded energy content as a result of a discharge event (Wh) |
|  | BESS charging power set point at DC side, inside the first segment of the efficiency linearization curve (up to 10% of inverter’s rated power) (W) |
|  | BESS discharging power set point at DC side, inside the first segment of the efficiency linearization curve (up to 10% of inverter’s rated power) (W) |
|  | Auxiliary binary variable for non-simultaneity of inverse flows at BESS and for switching the origin term of the efficiency linearization when charging |
|  | Auxiliary binary variable for non-simultaneity of inverse flows at BESS and for switching the origin term of the efficiency linearization when discharging |

General formulation

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Add-on: Dynamic SoC Limits Model

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Add-on: Inverter’s efficiency linearization

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