Module for generating Day Ahead Bids for Battery

v1.0 11/20/2018

Module Name

DayAheadBidBattery.py

Function Name

DayAheadBid

The inputs and output definitions for this function are given in Table-1 and 2 respectively

Table 1 Input definitions for DayAheadBid function in Battery module

Input Name	Input Type and size	Description
R_c	Float (1x1)	Rated charging power in kW for the battery
R_d	Float (1x1)	Rated discharging power in kW for the battery
L_{in}	Float (1x1)	Battery charging loss in %
L_{out}	Float (1x1)	Battery discharging loss in %
C_{min}	Float (1x1)	Minimum allowable stored energy in kWh (state of charge lower limit)
C_{max}	Float (1x1)	Maximum allowable stored energy in kWh (state of charge upper limit)
C_{init}	Float (1x1)	Initial stored energy in the battery in kWh
ProfitMargin	Float (1x1)	Specified in % and used to modify slope of bid curve. Set to 0 to disable
BindingObjFunc	Boolean (1x1)	If True, then optimization considers cleared price, quantities from previous iteration in the objective function
f_{DA}	List of Floats (1 x *windowLength*)	Forecasted prices in $/kWh for all the hours in the duration of *windowLength*
prev_clr_Quantity	List of Floats (1 x *windowLength*)	Cleared quantities (kWh) from previous market iteration for all hours
prev_clr_Price	List of Floats (1 x *windowLength*)	Cleared prices ($/kWh) from previous market iteration
batteryLifeDegFactor	Float (1x1)	Constant to model battery degradation
bidSpread	Integer (1x1)	This can be used to spread out bids in multiple hours. When set to 1 hour (recommended), it's effect is none
windowLength	Integer (1x1)	Length of day ahead optimization period in hours (e.g. 48 hours)
dayAheadCapacity	Float (1x1)	% of battery capacity reserved for day ahead bidding

Table 2 Output definitions for DayAheadBid function in Battery module

Output Name	**Output Type and size**	**Description**
CurveSlope	List of Floats (1 x *windowLength*)	Slopes of bid curves for all hours of the window specified by *windowLength*
yIntercept	List of Floats (1 x *windowLength*)	y-intercept of bid curves for all hours of the window specified by *windowLength*
bidTrack	List of Integers (1 x *windowLength*)	Specified for all hours of the window = -1 in case of no bid = 0 in case of charging bid = 1 in case if discharging bid
bidMade	List of Floats (1 x *windowLength*)	Optimal quantity from optimization for all hours of the window specified by *windowLength*