Title: Model Predictive Control Framework for Congestion Management with Large Batteries in Sub-Transmission Grid

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Abstract: RTE is building and will put into operation 3 large battery storage systems in 2021/2022 (10MW/20MWh). These batteries, together with intermittent renewable generation curtailment and line switching, will be used to manage congestions in 3 small subtransmission zones (63kV or 90kV). A local controller sends orders to the battery, to power plants and switches every 15 seconds, using all the Flexibility offered by permanent and emergency ratings, including Dynamic Line Rating when available. Controller's decision algorithm is Model Predictive Control: every 15 secondes, DC approximation model of the grid is computed based on latests real time measurements; then a Mixed Integer Programming model is built, taking into account delays of actions. This local controller does not have any forecast and is not be able to manage preventive actions, so a higher level scheduler will be in charge of security analysis (N-1 analysis), battery preventive actions, pre-discharging the battery for forthcoming grid congestions.