

LIST OF NOTATIONS

T	State of time
B	State of battery
U	The set of battery types
$T_{arrival}$	Time of motorcycle arrival at time t
$T_j^{arrival}$	Time of there is no motorcycle arrive at time t
i	Index of battery
j	Index of battery type
$SoC_{t,b}$	State of charge of battery b at the end of time slot t (%)
$SoC_{t-1,b}$	SOC of each battery at the t = t-1 of the simulation (%)
$s_{t,b}$	Swapping status
SoC_b^{max}	State of charge of the arriving electric motorcycles at time t (%)
SoC_t^{em}	State of charge of the arriving electric motorcycles at time (%)
$\Delta SoC_{t,b}^s$	The difference in SOC between a customers' DB and the swapped charged battery (%)
$x_{t,b}$	Positive variable
$P_{t,b}^c$	Charging power of battery b during time slot t (kWh)
$N^{swapped}$	The total number of batteries swapped at the BSS
N^{served}	The total number of batteries served at the BSS
P_{cg}^{MAXd}	Maximum battery discharging rate in kW
$P_{t,b}^d$	Discharging power of battery b during time slot t (kWh)
N_t^{units}	The number of battery units requested by Electric Motorcycle
G_j^c	Charger for each battery type j
$c_{t,b}$	Charging status
P_{cg}^{MAXch}	Maximum battery charging rate in kW.
DoD^{max}	Maximum depth of battery discharge in %
$SoC_{0,b}$	Initial SOC of each battery at the beginning of the simulation (%)
ω	Soc shaping charge characteristics in %
ζ	Battery Threshold in %
η^{ch}	The efficiency of charging

η^d	The efficiency of discharging
α	Slope
β	Intercept
$cost^{kWh}$	Electricity price in kWh (IDR)
$cost_b^s$	Swapping price in IDR
$cost_t^{rt}$	Real-time price in IDR
p_t^{LL}	The grid load level in kWh
p_{avg}^{LL}	The average of load level in kWh
$cost_t^{rf}$	The grid charging reference price in IDR
$K_{cd,t}$	The traded electricity quantity in kWh