

$$\begin{aligned}
\max Profit = & \\
& - (BatCap * batCosts) \\
& - workingCosts \\
& + \sum_{t_{quarter}}
\end{aligned}$$

accepted RL in & out:

$$\begin{aligned}
& + \sum_{s_{RL}^{out}} \sum_{s_{RL}^{in}} (\omega_{RL}^{in}(t_{block}, s_{RL}^{in}) * \omega_{RL}^{out}(t_{block}, s_{RL}^{out})) * (\\
& + \frac{1}{4} * (Q_{RL}^{in}(t_{block}, s_{RL}^{in}) * p_{RL}^{in}(t_{block}, s_{RL}^{in}))) \\
& + \frac{1}{4} * (Q_{RL}^{out}(t_{block}, s_{RL}^{out}) * p_{RL}^{out}(t_{block}, s_{RL}^{out}))) \\
& + \frac{1}{4} * (Q_{DA}^B(t_{hour}, s_{RL}^{in}, s_{RL}^{out}) * p_{DA}^{exp}(t_{hour}))) \\
& + (\sum_{S_{RA}} \omega_{RA}(S_{RA}) * p_{RA}^{in}(t_{quarter}, S_{RA}) * Q_{RA}^{inrB}(t_{quarter}, S_{RA}, s_{RL}^{in}, s_{RL}^{out})) \\
& + (\sum_{S_{RA}} \omega_{RA}(S_{RA}) * p_{RA}^{out}(t_{quarter}, S_{RA}) * Q_{RA}^{outrB}(t_{quarter}, S_{RA}, s_{RL}^{in}, s_{RL}^{out}))
\end{aligned}$$

accepted RL in & declined out:

$$\begin{aligned}
& + \sum_{s_{RL}^{out}} \sum_{s_{RL}^{in}} (\omega_{RL}^{in}(t_{block}, s_{RL}^{in}) * (1 - \omega_{RL}^{out}(t_{block}, s_{RL}^{out}))) * (\\
& + \frac{1}{4} * (Q_{RL}^{in}(t_{block}, s_{RL}^{in}) * p_{RL}^{in}(t_{block}, s_{RL}^{in}))) \\
& + \frac{1}{4} * (Q_{DA}^I(t_{hour}, s_{RL}^{in}, s_{RL}^{out}) * p_{DA}^{exp}(t_{hour}))) \\
& + (\sum_{S_{RA}} \omega_{RA}(S_{RA}) * p_{RA}^{in}(t_{quarter}, S_{RA}) * Q_{RA}^{inrl}(t_{quarter}, S_{RA}, s_{RL}^{in}, s_{RL}^{out})) \\
& + (\sum_{S_{RA}} \omega_{RA}(S_{RA}) * p_{RA}^{out}(t_{quarter}, S_{RA}) * Q_{RA}^{outrl}(t_{quarter}, S_{RA}, s_{RL}^{in}, s_{RL}^{out}))
\end{aligned}$$

declined RL in & accepted out:

$$\begin{aligned}
& + \sum_{s_{RL}^{out}} \sum_{s_{RL}^{in}} ((1 - \omega_{RL}^{in}(t_{block}, s_{RL}^{in})) * \omega_{RL}^{out}(t_{block}, s_{RL}^{out})) * (\\
& + \frac{1}{4} * (Q_{RL}^{out}(t_{block}, s_{RL}^{out}) * p_{RL}^{out}(t_{block}, s_{RL}^{out}))) \\
& + \frac{1}{4} * (Q_{DA}^O(t_{hour}, s_{RL}^{in}, s_{RL}^{out}) * p_{DA}^{exp}(t_{hour}))) \\
& + (\sum_{S_{RA}} \omega_{RA}(S_{RA}) * p_{RA}^{in}(t_{quarter}, S_{RA}) * Q_{RA}^{inrO}(t_{quarter}, S_{RA}, s_{RL}^{in}, s_{RL}^{out})) \\
& + (\sum_{S_{RA}} \omega_{RA}(S_{RA}) * p_{RA}^{out}(t_{quarter}, S_{RA}) * Q_{RA}^{outrO}(t_{quarter}, S_{RA}, s_{RL}^{in}, s_{RL}^{out}))
\end{aligned}$$

declined RL in & out:

$$\begin{aligned}
& + \sum_{s_{RL}^{out}} \sum_{s_{RL}^{in}} ((1 - (\omega_{RL}^{in}(t_{block}, s_{RL}^{in}))) * (1 - \omega_{RL}^{out}(t_{block}, s_{RL}^{out}))) * (\\
& + \frac{1}{4} * (Q_{DA}^N(t_{hour}, s_{RL}^{in}, s_{RL}^{out}) * p_{DA}^{exp}(t_{hour}))) \\
& + (\sum_{S_{RA}} \omega_{RA}(S_{RA}) * p_{RA}^{in}(t_{quarter}, S_{RA}) * Q_{RA}^{inrN}(t_{quarter}, S_{RA}, s_{RL}^{in}, s_{RL}^{out})) \\
& + (\sum_{S_{RA}} \omega_{RA}(S_{RA}) * p_{RA}^{out}(t_{quarter}, S_{RA}) * Q_{RA}^{outrN}(t_{quarter}, S_{RA}, s_{RL}^{in}, s_{RL}^{out}))
\end{aligned}$$

$$\forall t_{hour} = \left\lfloor \frac{t_{quarter}}{4} \right\rfloor, t_{block} = \left\lfloor \frac{t_{quarter}}{16} \right\rfloor, \omega_{RA}(S_{RA}) = 1/|S_{RA}|$$

$$workingCosts = \sum_{t_{quarter}}$$

accepted RL in & out:

$$\begin{aligned} & \sum_{s_{RL}^{out}} \sum_{s_{RL}^{in}} (\omega_{RL}^{in}(t_{block}, s_{RL}^{in}) * \omega_{RL}^{out}(t_{block}, s_{RL}^{out})) * (\\ & + \sum_{S_{RA}} WP_{RA}^{inrB}(t_{quarter}, S_{RA}, s_{RL}^{in}, s_{RL}^{out}) * p_{ER}^- * \omega_{RA}(S_{RA})) \\ & + \sum_{S_{RA}} WP_{RA}^{outrB}(t_{quarter}, S_{RA}, s_{RL}^{in}, s_{RL}^{out}) * p_{ER}^+ * \omega_{RA}(S_{RA}) \end{aligned} \quad (0.2)$$

accepted RL in & declined out:

$$\begin{aligned} & + \sum_{s_{RL}^{out}} \sum_{s_{RL}^{in}} (\omega_{RL}^{in}(t_{block}, s_{RL}^{in}) * (1 - \omega_{RL}^{out}(t_{block}, s_{RL}^{out}))) * (\\ & + \sum_{S_{RA}} WP_{RA}^{inrl}(t_{quarter}, S_{RA}, s_{RL}^{in}, s_{RL}^{out}) * p_{ER}^- * \omega_{RA}(S_{RA})) \\ & + \sum_{S_{RA}} WP_{RA}^{outrl}(t_{quarter}, S_{RA}, s_{RL}^{in}, s_{RL}^{out}) * p_{ER}^+ * \omega_{RA}(S_{RA}) \end{aligned}$$

declined RL in & accepted out:

$$\begin{aligned} & + \sum_{s_{RL}^{out}} \sum_{s_{RL}^{in}} ((1 - \omega_{RL}^{in}(t_{block}, s_{RL}^{in})) * \omega_{RL}^{out}(t_{block}, s_{RL}^{out})) * (\\ & + \sum_{S_{RA}} WP_{RA}^{inrO}(t_{quarter}, S_{RA}, s_{RL}^{in}, s_{RL}^{out}) * p_{ER}^- * \omega_{RA}(S_{RA})) \\ & + \sum_{S_{RA}} WP_{RA}^{outrO}(t_{quarter}, S_{RA}, s_{RL}^{in}, s_{RL}^{out}) * p_{ER}^+ * \omega_{RA}(S_{RA}) \end{aligned}$$

declined RL in & out:

$$\begin{aligned} & + \sum_{s_{RL}^{out}} \sum_{s_{RL}^{in}} (1 - (\omega_{RL}^{in}(t_{block}, s_{RL}^{in}) * (1 - \omega_{RL}^{out}(t_{block}, s_{RL}^{out})))) * (\\ & + \sum_{S_{RA}} WP_{RA}^{inrN}(t_{quarter}, S_{RA}, s_{RL}^{in}, s_{RL}^{out}) * p_{ER}^- * \omega_{RA}(S_{RA})) \\ & + \sum_{S_{RA}} WP_{RA}^{outrN}(t_{quarter}, S_{RA}, s_{RL}^{in}, s_{RL}^{out}) * p_{ER}^+ * \omega_{RA}(S_{RA}) \\ & \forall t_{hour} = \left\lfloor \frac{t_{quarter}}{4} \right\rfloor \end{aligned} \quad (0.3)$$

*profits *profit RL

$$profitRLout = + \sum (t_{block}, + \sum_{s_{RL}^{out}} \sum_{s_{RL}^{in}} (\omega_{RL}^{in}(t_{block}, s_{RL}^{in}) * \omega_{RL}^{out}(t_{block}, s_{RL}^{out})) * (+ (4 * (Q_{RL}^{out}(t_{block}, s_{RL}^{out}) * p_{RL}^{out}(t_{block}, s_{RL}^{out})))))) + \quad (0.4)$$

$$+ \sum_{s_{RL}^{out}} \sum_{s_{RL}^{in}} (\omega_{RL}^{in}(t_{block}, s_{RL}^{in}) * (1 - \omega_{RL}^{out}(t_{block}, s_{RL}^{out}))) * (+ (4 * (Q_{RL}^{in}(t_{block}, s_{RL}^{in}) * p_{RL}^{in}(t_{block}, s_{RL}^{in})))));$$

*profit DA

$$profitDA = \sum (t_{block}, + \sum_{s_{RL}^{out}} \sum_{s_{RL}^{in}} (\omega_{RL}^{in}(t_{block}, s_{RL}^{in}) * \omega_{RL}^{out}(t_{block}, s_{RL}^{out})) * (\sum (t_{hour} \text{map}_{hour_block}(t_{hour}, t_{block}), (Q_{DA}^B(t_{hour}, s_{RL}^{in}))) \quad (0.5)$$

*profit RA

$$profitRAin = \sum (t_{block}, + \sum_{s_{RL}^{out}} \sum_{s_{RL}^{in}} (\omega_{RL}^{in}(t_{block}, s_{RL}^{in}) * \omega_{RL}^{out}(t_{block}, s_{RL}^{out})) * (0.25 * \sum (t_{quarter} \text{map}_{quarter_block}(t_{quarter}, t_{block}))) \quad (0.6)$$

$$profitRAout = \sum (t_{block}, + \sum_{s_{RL}^{out}} \sum_{s_{RL}^{in}} (\omega_{RL}^{in}(t_{block}, s_{RL}^{in}) * \omega_{RL}^{out}(t_{block}, s_{RL}^{out})) * (0.25 * \sum (t_{quarter} \text{map}_{quarter_block}(t_{quarter}, t_{block}))) \quad (0.7)$$

* accepted RL in out:

*accepted RL in declined out:

*declined RL in accepted out:

$$\sum_Q^{outR} RA = \sum ((t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}), Q_{RA}^{outR}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})); \quad (0.8)$$

$$\sum_Q^{inR} RA = \sum ((t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}), Q_{RA}^{inR}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})); \quad (0.9)$$

$$\sum_Q^{rO} DA(s_{RL}^{in}, s_{RL}^{out}) = \sum ((t_{hour}), Q_{DA}^{rO}(t_{hour}, s_{RL}^{in}, s_{RL}^{out})); \quad (0.10)$$

$$\sum_Q^{rO} rO_{reload} = \sum ((t_{hour}, s_{RL}^{in}, s_{RL}^{out}), Q_{rO_{reload}}(t_{hour}, s_{RL}^{in}, s_{RL}^{out})); \quad (0.11)$$

*declined RL in out:

$$\sum_Q^{outRN} RA = \sum ((t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}), Q_{RA}^{outRN}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})); \quad (0.12)$$

$$\sum_Q^{inrN} RA = \sum_Q ((t_{quarter}, S_{RA}, S_{RL}^{in}, S_{RL}^{out}), Q_{RA}^{inrN}(t_{quarter}, S_{RA}, S_{RL}^{in}, S_{RL}^{out})); \quad (0.13)$$

$$\sum_Q^{rN} DA = \sum_Q ((t_{hour}, S_{RL}^{in}, S_{RL}^{out}), Q_{DA}^{rN}(t_{hour}, S_{RL}^{in}, S_{RL}^{out})); \quad (0.14)$$

$$\sum_Q reload = \sum_Q ((t_{hour}, S_{RL}^{in}, S_{RL}^{out}), Q_{reload}(t_{hour}, S_{RL}^{in}, S_{RL}^{out})); \quad (0.15)$$

* constraints *battery cap

$$BatCap \geq \max(Q_{RA}^{inrB}, Q_{RA}^{inrl}, Q_{RA}^{inrO}, Q_{RA}^{inrN}, Q_{RA}^{outrB}, Q_{RA}^{outrl}, Q_{RA}^{outrO}, Q_{RA}^{outrN}); \quad (0.16)$$

$$BatCap \geq \max(Q_{RA}^{inrB}, Q_{RA}^{inrl}, Q_{RA}^{inrO}, Q_{RA}^{inrN}, Q_{RA}^{outrB}, Q_{RA}^{outrl}, Q_{RA}^{outrO}, Q_{RA}^{outrN}, \quad (0.17)$$

* $Q_{RL}^{in} * 4, Q_{RL}^{out} * 4$;

*access point:

$$a + \sum_Q ((S_{RA}, S_{RL}^{in}, S_{RL}^{out}), fakeReload_{RA}^{inrB}(t_{quarter}, S_{RA}, S_{RL}^{in}, S_{RL}^{out}) + Q_{RA}^{inrB}(t_{quarter}, S_{RA}, S_{RL}^{in}, S_{RL}^{out})) \geq \sum_Q ((S_{DA}, S_{RL}^{in}, S_{RL}^{out}), \sum_Q (t_{hour}m \quad (0.18)$$

$$a + \sum_Q ((S_{RA}, S_{RL}^{in}, S_{RL}^{out}), fakeReload_{RA}^{inrl}(t_{quarter}, S_{RA}, S_{RL}^{in}, S_{RL}^{out}) + Q_{RA}^{inrl}(t_{quarter}, S_{RA}, S_{RL}^{in}, S_{RL}^{out})) \geq \sum_Q ((S_{DA}, S_{RL}^{in}, S_{RL}^{out}), \sum_Q (t_{hour}m \quad (0.19)$$

$$a + \sum_Q ((S_{RA}, S_{RL}^{in}, S_{RL}^{out}), fakeReload_{RA}^{inrO}(t_{quarter}, S_{RA}, S_{RL}^{in}, S_{RL}^{out}) + Q_{RA}^{inrO}(t_{quarter}, S_{RA}, S_{RL}^{in}, S_{RL}^{out})) \geq \sum_Q ((S_{DA}, S_{RL}^{in}, S_{RL}^{out}), \sum_Q (t_{hour}m \quad (0.20)$$

$$a + \sum_Q ((S_{RA}, S_{RL}^{in}, S_{RL}^{out}), fakeReload_{RA}^{inrN}(t_{quarter}, S_{RA}, S_{RL}^{in}, S_{RL}^{out}) + Q_{RA}^{inrN}(t_{quarter}, S_{RA}, S_{RL}^{in}, S_{RL}^{out})) \geq \sum_Q ((S_{DA}, S_{RL}^{in}, S_{RL}^{out}), \sum_Q (t_{hour}m \quad (0.21)$$

*battery performance restrictions:

$$r = BatCap * r_{Bat}; \quad (0.22)$$

$$\sum_{S_{RL}^{out}} Q_{RL}^{out}(t_{block}, S_{RL}^{out}) \leq r; \quad (0.23)$$

$$\sum_{s_{RL}^{in}} Q_{RL}^{in}(t_{block}, s_{RL}^{in}) \leq r; \quad (0.24)$$

$$\sum ((s_{RA}, s_{RL}^{in}, s_{RL}^{out}), Q_{RA}^{outB}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \leq r/4; \quad (0.25)$$

$$\sum ((s_{RA}, s_{RL}^{in}, s_{RL}^{out}), Q_{RA}^{outI}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \leq r/4; \quad (0.26)$$

$$\sum ((s_{RA}, s_{RL}^{in}, s_{RL}^{out}), Q_{RA}^{outO}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \leq r/4; \quad (0.27)$$

$$\sum ((s_{RA}, s_{RL}^{in}, s_{RL}^{out}), Q_{RA}^{outN}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \leq r/4; \quad (0.28)$$

$$\sum ((s_{RA}, s_{RL}^{in}, s_{RL}^{out}), Q_{RA}^{inrB}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \leq r/4; \quad (0.29)$$

$$\sum ((s_{RA}, s_{RL}^{in}, s_{RL}^{out}), Q_{RA}^{inrI}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \leq r/4; \quad (0.30)$$

$$\sum ((s_{RA}, s_{RL}^{in}, s_{RL}^{out}), Q_{RA}^{inrO}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \leq r/4; \quad (0.31)$$

$$\sum ((s_{RA}, s_{RL}^{in}, s_{RL}^{out}), Q_{RA}^{inrN}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \leq r/4; \quad (0.32)$$

*batter cap restrictions

$$BatStat(t_{quarter}) \leq BatCap; \quad (0.33)$$

$$\sum_{s_{RL}^{out}} Q_{RL}^{out}(t_{block}, s_{RL}^{out}) * 4 \leq BatCap; \quad (0.34)$$

$$\sum_{s_{RL}^{in}} Q_{RL}^{in}(t_{block}, s_{RL}^{in}) * 4 \leq BatCap; \quad (0.35)$$

$$\sum ((s_{RA}, s_{RL}^{in}, s_{RL}^{out}), Q_{RA}^{outB}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \leq BatCap; \quad (0.36)$$

$$\sum ((s_{RA}, s_{RL}^{in}, s_{RL}^{out}), Q_{RA}^{outI}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \leq BatCap; \quad (0.37)$$

$$\sum ((s_{RA}, s_{RL}^{in}, s_{RL}^{out}), Q_{RA}^{outO}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \leq BatCap; \quad (0.38)$$

$$\sum ((s_{RA}, s_{RL}^{in}, s_{RL}^{out}), Q_{RA}^{outN}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \leq BatCap; \quad (0.39)$$

$$\sum ((s_{RA}, s_{RL}^{in}, s_{RL}^{out}), Q_{RA}^{inrB}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \leq BatCap; \quad (0.40)$$

$$\sum ((s_{RA}, s_{RL}^{in}, s_{RL}^{out}), Q_{RA}^{inrI}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \leq BatCap; \quad (0.41)$$

$$\sum ((s_{RA}, s_{RL}^{in}, s_{RL}^{out}), Q_{RA}^{inrO}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \leq BatCap; \quad (0.42)$$

$$\sum ((s_{RA}, s_{RL}^{in}, s_{RL}^{out}), Q_{RA}^{inrN}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \leq BatCap; \quad (0.43)$$

*battery status restrictions *expectet battery value in t+1:

*accepted RL in out: $+\sum_{s_{RL}^{out}} \sum_{s_{RL}^{in}} \sum (t_{block} \text{map}_{quarter_block}(t_{quarter}, t_{block}), (\omega_{RL}^{in}(t_{block}, s_{RL}^{in}) * \omega_{RL}^{out}(t_{block}, s_{RL}^{out}))) *$
 $(+\sum (t_{hour} \text{map}_{quarter_hour}(t_{quarter}, t_{hour}), Q_{rBr} \text{eload}(t_{hour}, s_{RL}^{in}, s_{RL}^{out})/4) + \sum_{s_{RA}} \text{fakeReload}_{RA}^{inrB}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) +$
 $((1/\text{card}(s_{RA})) * (Q_{RA}^{inrB}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})))) - \sum_{s_{RA}} \text{fakeReload}_{RA}^{outB}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) + ((1/\text{card}(s_{RA})) *$
 $(Q_{RA}^{outB}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})))))) * \text{acceptedRLin declinedout} : + \sum_{s_{RL}^{out}} \sum_{s_{RL}^{in}} \sum (t_{block} \text{map}_{quarter_block}(t_{quarter}, t_{block}), (\omega_{RL}^{in}(t_{block}, s_{RL}^{in}) * (1 - \omega_{RL}^{out}(t_{block}, s_{RL}^{out})))) *$
 $(+\sum (t_{hour} \text{map}_{quarter_hour}(t_{quarter}, t_{hour}), Q_{rIr} \text{eload}(t_{hour}, s_{RL}^{in}, s_{RL}^{out})/4) + \sum_{s_{RA}} \text{fakeReload}_{RA}^{inrI}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) +$
 $((1/\text{card}(s_{RA})) * (Q_{RA}^{inrI}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})))) - \sum_{s_{RA}} \text{fakeReload}_{RA}^{outI}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) + ((1/\text{card}(s_{RA})) *$
 $(Q_{RA}^{outI}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}))))))$

*declined RL in accepted out: $+\sum_{s_{RL}^{out}} \sum_{s_{RL}^{in}} \sum (t_{block} \text{map}_{quarter_block}(t_{quarter}, t_{block}), ((1 - \omega_{RL}^{in}(t_{block}, s_{RL}^{in})) * \omega_{RL}^{out}(t_{block}, s_{RL}^{out}))) *$
 $(+\sum (t_{hour} \text{map}_{quarter_hour}(t_{quarter}, t_{hour}), Q_{rOr} \text{eload}(t_{hour}, s_{RL}^{in}, s_{RL}^{out})/4) + \sum_{s_{RA}} \text{fakeReload}_{RA}^{inrO}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) +$
 $((1/\text{card}(s_{RA})) * (Q_{RA}^{inrO}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})))) - \sum_{s_{RA}} \text{fakeReload}_{RA}^{outO}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) + ((1/\text{card}(s_{RA})) *$
 $(Q_{RA}^{outO}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})))))) * \text{declinedRLin out} : + \sum_{s_{RL}^{out}} \sum_{s_{RL}^{in}} \sum (t_{block} \text{map}_{quarter_block}(t_{quarter}, t_{block}), (1 - \omega_{RL}^{in}(t_{block}, s_{RL}^{in})) * (1 - \omega_{RL}^{out}(t_{block}, s_{RL}^{out})))) *$
 $(+\sum (t_{hour} \text{map}_{quarter_hour}(t_{quarter}, t_{hour}), Q_{rNr} \text{eload}(t_{hour}, s_{RL}^{in}, s_{RL}^{out})/4) + \sum_{s_{RA}} \text{fakeReload}_{RA}^{inrN}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) +$
 $((1/\text{card}(s_{RA})) * (Q_{RA}^{inrN}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})))) - \sum_{s_{RA}} \text{fakeReload}_{RA}^{outN}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) + ((1/\text{card}(s_{RA})) * (Q_{RA}^{outN}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})))))) *$

$$\text{fakeReload}_{RA}^{inrB}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) = WP_{RA}^{inrB}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}); \quad (0.44)$$

$$\text{fakeReload}_{RA}^{outB}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) = WP_{RA}^{outB}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}); \quad (0.45)$$

$$\text{fakeReload}_{RA}^{inrI}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) = WP_{RA}^{inrI}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}); \quad (0.46)$$

$$\text{fakeReload}_{RA}^{outI}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) = WP_{RA}^{outI}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}); \quad (0.47)$$

$$fakeReload_{RA}^{inrO}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) = WP_{RA}^{inrO}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}); \quad (0.48)$$

$$fakeReload_{RA}^{outrO}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) = WP_{RA}^{outrO}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}); \quad (0.49)$$

$$fakeReload_{RA}^{inrN}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) = WP_{RA}^{inrN}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}); \quad (0.50)$$

$$fakeReload_{RA}^{outrN}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) = WP_{RA}^{outrN}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}); \quad (0.51)$$

$$testSPM(t_{quarter}, s_{RA}) = \omega_{RA}(s_{RA})_C^{out} all(t_{quarter}, s_{RA}) - 0.1 * seriesOne(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}); \quad (0.52)$$

$$0 \leq Q_{RA}^{outrN}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) + (m * (1 - seriesOne(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}))); \quad (0.53)$$

$$0 \geq Q_{RA}^{outrN}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) - (m * seriesOne(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})); \quad (0.54)$$

*RA dynamics *out

*park restrictions:

$$\sum ((s_{DA}, s_{RL}^{in}, s_{RL}^{out}), Q_{DA}^B(t_{hour}, s_{RL}^{in}, s_{RL}^{out})) \leq parkCap * parkProfile(t_{hour}) - \sum ((s_{DA}, s_{RL}^{in}, s_{RL}^{out}), Q_{rB} reload(t_{hour}, s_{RL}^{in}, s_{RL}^{out})) \quad (0.55)$$

$$\sum ((s_{DA}, s_{RL}^{in}, s_{RL}^{out}), Q_{DA}^I(t_{hour}, s_{RL}^{in}, s_{RL}^{out})) \leq parkCap * parkProfile(t_{hour}) - \sum ((s_{DA}, s_{RL}^{in}, s_{RL}^{out}), Q_{rI} reload(t_{hour}, s_{RL}^{in}, s_{RL}^{out})); \quad (0.56)$$

$$\sum ((s_{DA}, s_{RL}^{in}, s_{RL}^{out}), Q_{DA}^O(t_{hour}, s_{RL}^{in}, s_{RL}^{out})) \leq parkCap * parkProfile(t_{hour}) - \sum ((s_{DA}, s_{RL}^{in}, s_{RL}^{out}), Q_{rO} reload(t_{hour}, s_{RL}^{in}, s_{RL}^{out})) \quad (0.57)$$

$$\sum ((s_{DA}, s_{RL}^{in}, s_{RL}^{out}), Q_{DA}^N(t_{hour}, s_{RL}^{in}, s_{RL}^{out})) \leq parkCap * parkProfile(t_{hour}) - \sum ((s_{DA}, s_{RL}^{in}, s_{RL}^{out}), Q_{rN} reload(t_{hour}, s_{RL}^{in}, s_{RL}^{out})) \quad (0.58)$$

*market restrictions:

$$(Q_{RA}^{outrB}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \geq \sum (t_{block} map_{quarter} block(t_{quarter}, t_{block}), Q_{RL}^{out}(t_{block}, s_{RL}^{out})); 1 \quad (0.59)$$

$$(Q_{RA}^{outrO}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \geq \sum (t_{block} map_{quarter} block(t_{quarter}, t_{block}), Q_{RL}^{out}(t_{block}, s_{RL}^{out})); 1 \quad (0.60)$$

$$(Q_{RA}^{inrI}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \geq \sum (t_{block} map_{quarter} block(t_{quarter}, t_{block}), Q_{RL}^{in}(t_{block}, s_{RL}^{in})); 1 \quad (0.61)$$

$$(Q_{RA}^{inrB}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \geq \sum (t_{block} map_{quarter} block(t_{quarter}, t_{block}), Q_{RL}^{in}(t_{block}, s_{RL}^{in})); 1 \quad (0.62)$$

$$(Q_{RA}^{outrl}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \geq \sum (t_{block} \text{map}_{quarter_block}(t_{quarter}, t_{block}), Q_{RL}^{out}(t_{block}, s_{RL}^{out})); 1 \quad (0.63)$$

$$(Q_{RA}^{outrN}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \geq \sum (t_{block} \text{map}_{quarter_block}(t_{quarter}, t_{block}), Q_{RL}^{out}(t_{block}, s_{RL}^{out})); 1 \quad (0.64)$$

$$(Q_{RA}^{inrO}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \geq \sum (t_{block} \text{map}_{quarter_block}(t_{quarter}, t_{block}), Q_{RL}^{in}(t_{block}, s_{RL}^{in})); 1 \quad (0.65)$$

$$(Q_{RA}^{inrN}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out})) \geq \sum (t_{block} \text{map}_{quarter_block}(t_{quarter}, t_{block}), Q_{RL}^{in}(t_{block}, s_{RL}^{in})); 1 \quad (0.66)$$

* accepted RL in out:

$$Q_{RA}^{inrB}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) \leq q_{RA}^{in} \max(t_{quarter}, s_{RA}); \quad (0.67)$$

$$Q_{RA}^{inrO}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) \leq q_{RA}^{in} \max(t_{quarter}, s_{RA}); \quad (0.68)$$

$$Q_{RA}^{inrl}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) \leq q_{RA}^{in} \max(t_{quarter}, s_{RA}); \quad (0.69)$$

$$Q_{RA}^{inrN}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) \leq q_{RA}^{in} \max(t_{quarter}, s_{RA}); \quad (0.70)$$

$$Q_{RA}^{outrB}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) \leq q_{RA}^{out} \max(t_{quarter}, s_{RA}); \quad (0.71)$$

$$Q_{RA}^{outrl}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) \leq q_{RA}^{out} \max(t_{quarter}, s_{RA}); \quad (0.72)$$

$$Q_{RA}^{outrO}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) \leq q_{RA}^{out} \max(t_{quarter}, s_{RA}); \quad (0.73)$$

$$Q_{RA}^{outrN}(t_{quarter}, s_{RA}, s_{RL}^{in}, s_{RL}^{out}) \leq q_{RA}^{out} \max(t_{quarter}, s_{RA}); \quad (0.74)$$

$$\sum (t_{block} \text{map}_{quarter_block}(t_{quarter}, t_{block}), Q_{RL}^{in}(t_{block}, s_{RL}^{in})) * 0.25 \leq \text{BatCap} - \text{BatStat}(t_{quarter}); 1 \quad (0.75)$$

$$\sum (t_{block} \text{map}_{quarter_block}(t_{quarter}, t_{block}), Q_{RL}^{out}(t_{block}, s_{RL}^{out})) * 0.25 \leq \text{BatStat}(t_{quarter}); 1 \quad (0.76)$$

*accepted RL in declined out: *declined RL in accepted out: *declined RL in out: