The linearization of the nonlinear functions: $\mathrm{h}(\cdot)$, $\max(\cdot,\cdot)$, $\mathrm{h}(\cdot)\mathrm{h}(\cdot)$, $\mathrm{h}(\cdot)\max(\cdot,\cdot)$, $\mathrm{h}(\cdot)\min(\cdot,\cdot)$, $\max(\cdot,\cdot)\min(\cdot,\cdot)$ is as follows:

$$\mathrm{h}(\rho_{gt}-K)=\theta_{gt}^{\rho,\mathrm{K}},\forall g,\forall t \tag{10w}$$

$$\max(\rho_{gt}-K,0)=y_{gt}^{\rho,\mathrm{K},\max},\forall g,\forall t \tag{10x}$$

$$\mathrm{h}(\sum_k P_{gk}^{\mathrm{ROG}}-\sum_k P_{gkt}^{\mathrm{G}})=\theta_{gt}^{\mathrm{P}},\forall g,\forall t \tag{10y}$$

$$\min(\sum_k P_{gkt}^{\mathrm{G}},\sum_k P_{gk}^{\mathrm{ROG}})=y_{gt}^{\mathrm{P},\min},\forall g,\forall t \tag{10z}$$

$$\mathrm{h}(\rho_{gt}-K)\mathrm{h}(\sum_k P_{gk}^{\mathrm{ROG}}-\sum_k P_{gkt}^{\mathrm{G}})=\theta_{gt}^{\rho,\mathrm{K},\mathrm{P}},\quad \forall g,\forall t \tag{10aa}$$

$$\mathrm{h}(\rho_{gt}-K)\min(\sum_k P_{gkt}^{\mathrm{G}},\sum_k P_{gk}^{\mathrm{ROG}})=z_{gt}^{\rho,\mathrm{K},\mathrm{P},\min},\quad \forall g,\forall t \tag{10bb}$$

$$\mathrm{h}(\sum_k P_{gk}^{\mathrm{ROG}}-\sum_k P_{gkt}^{\mathrm{G}})\max(\rho_{gt}-K,0) =z_{gt}^{\mathrm{P},\rho,\mathrm{K},\max},\forall g,\forall t \tag{10cc}$$

$$\mathrm{h}(\rho_{gt}-K)\sum_k P_{gk}^{\mathrm{ROG}}=z_{gt}^{\rho,\mathrm{K},\mathrm{P},\mathrm{RO}},\forall g,\forall t \tag{10dd}$$

$$\mathrm{h}(\rho_{gt}-K)\max(\sum_k P_{gk}^{\mathrm{ROG}}-\sum_k P_{gkt}^{\mathrm{G}},0)= z_{gt}^{\rho,\mathrm{K},\mathrm{P},\mathrm{RO}}-z_{gt}^{\rho,\mathrm{K},\mathrm{P},\min},\forall g,\forall t \tag{10ee}$$

$$0\leqslant y_{gt}^{\rho,\mathrm{K},\max}\leqslant M\theta_{gt}^{\rho,\mathrm{K}},\forall g,\forall t \tag{10ff}$$

$$\rho_{gt}-K\leqslant y_{gt}^{\rho,\mathrm{K},\max}\leqslant \rho_{gt}-K+M(1-\theta_{gt}^{\rho,\mathrm{K}}),\quad \forall g,\forall t \tag{10gg}$$

$$\sum_k P_{gkt}^{\mathrm{G}}-M(1-\theta_{gt}^{\mathrm{P}})\leqslant y_{gt}^{\mathrm{P},\min}\leqslant \sum_k P_{gkt}^{\mathrm{G}},\forall g,\forall t \tag{10hh}$$

$$\sum_k P_{gk}^{\mathrm{ROG}}-M\theta_{gt}^{\mathrm{P}}\leqslant y_{gt}^{\mathrm{P},\min}\leqslant P_{gk}^{\mathrm{ROG}},\forall g,\forall t \tag{10ii}$$

$$\theta_{gt}^{\rho,\mathrm{K},\mathrm{P}}\leqslant \theta_{gt}^{\rho,\mathrm{K}},\forall g,\forall t \tag{10jj}$$

$$\theta_{gt}^{\rho,\mathrm{K},\mathrm{P}}\leqslant \theta_{gt}^{\mathrm{P}},\forall g,\forall t \tag{10kk}$$

$$\theta_{gt}^{\rho,\mathrm{K},\mathrm{P}}\geqslant \theta_{gt}^{\rho,\mathrm{K}}+\theta_{gt}^{\mathrm{P}}-1,\forall g,\forall t \tag{10ll}$$

$$-M\theta_{gt}^{\rho,\mathrm{K}}\leqslant z_{gt}^{\rho,\mathrm{K},\mathrm{P},\min}\leqslant M\theta_{gt}^{\rho,\mathrm{K}},\forall g,\forall t \tag{10mm}$$

$$y_{gt}^{\mathrm{P},\min}-M(1-\theta_{gt}^{\rho,\mathrm{K}})\leqslant z_{gt}^{\rho,\mathrm{K},\mathrm{P},\min}\leqslant y_{gt}^{\mathrm{P},\min}+M(1-\theta_{gt}^{\rho,\mathrm{K}}),\forall g,\forall t \tag{10nn}$$

$$-M\theta_{gt}^{\mathrm{P}}\leqslant z_{gt}^{\mathrm{P},\rho,\mathrm{K},\max}\leqslant M\theta_{gt}^{\mathrm{P}},\forall g,\forall t \tag{10oo}$$

$$y_{gt}^{\rho,\mathrm{K},\max}-M(1-\theta_{gt}^{\mathrm{P}})\leqslant z_{gt}^{\mathrm{P},\rho,\mathrm{K},\max}\leqslant y_{gt}^{\rho,\mathrm{K},\max}+M(1-\theta_{gt}^{\mathrm{P}}),\forall g,\forall t \tag{10pp}$$

$$-M\theta_{gt}^{\rho,\mathrm{K}}\leqslant z_{gt}^{\rho,\mathrm{K},\mathrm{P},\mathrm{RO}}\leqslant M\theta_{gt}^{\rho,\mathrm{K}},\forall g,\forall t \tag{10qq}$$

$$\sum_k P_{gk}^{\mathrm{ROG}}-M(1-\theta_{gt}^{\rho,\mathrm{K}})\leqslant z_{gt}^{\rho,\mathrm{K},\mathrm{P},\mathrm{RO}}\leqslant \sum_k P_{gk}^{\mathrm{ROG}}+M(1-\theta_{gt}^{\rho,\mathrm{K}}),\forall g,\forall t \tag{10rr}$$

$$\{\theta_{gt}^{\rho,\mathrm{K}},\theta_{gt}^{\mathrm{P}},\theta_{gt}^{\rho,\mathrm{K},\mathrm{P}}\}\in\{0,1\} \tag{10ss}$$

Except for $\max(\rho_{gt}-K,0)\min(\sum_k P_{gkt}^{\mathrm{G}},\sum_k P_{gk}^{\mathrm{ROG}})$, all nonlinear terms are linearized through Eqs. (10w)-(10ss). $\max(\rho_{gt}-K,0)\min(\sum_k P_{gkt}^{\mathrm{G}},\sum_k P_{gk}^{\mathrm{ROG}})=y_{gt}^{\rho,\mathrm{K},\max}y_{gt}^{\mathrm{P},\min}$ is linearized by the binary expansion method through Eqs. (10n)-(10s).