## Supplementary Materials: Nomenclature

Subscript $s_{max}^{down}/s_{max}^{up}$ pumping power in upper and lower direction [-] $el$ $electrical$ $\dot{V}_{max}^{in}/\dot{V}_{max}$ Maximum inflow outflow of storage [m³/h] $i, j$ row and column of matrix A $t_{ret}$ retention time [h]Losswater loss $V_{dead}$ dead volume [m³]max/minmaximum/minimum $\Delta V_{min}$ $/\Delta V_{max}$ minimum/maximum flow rate change [m³/h]retretention timeVariables	wer in upper and on [-] flow outflow of b] ne [h] e [m <sup>3</sup> ] aximum flow rate b]
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Superscript $P_{tn}^{spot}$ power consumption of plant	mption of plant
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<i>clean</i> clean water storage <b>P</b> <sup>plant</sup> power consumption of entire	[MW]
[MW]	[MW] mption of entire plant
<i>demand</i> bourly water demand <b>s</b> <sup>on</sup> binary variable defining state	[MW] mption of entire plant
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<i>in/out</i> inflow/outflow $s^{up,n}/s^{down,n}$ and shutdown procedure of the second state of the second st	[MW] mption of entire plant ble defining state of mption point [0/1] ble defining start-up m procedure [0/1] ble defining start-up
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$P_t$	pumping power [MW]	<b>b</b> <sub>i</sub>	coefficient	
$P_t^n$	pumping power of the nth power consumption point [MW]	x <sub>ij</sub>	variable	
$P_{max}^{plant}$	maximum power consumption of plant[MW]	Z	objective function	

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