

# Supplementary Information

## Multiple time grids in operational optimisation of energy systems with short- and long-term thermal energy storage

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### 1 Heating demand and weather data

The synthetic heating demand data can be found in the accompanying Microsoft Excel file (Heating\_Demand\_Data\_20xx-20xx.csv). Both one year (2012-2013) and multi-years (2007-2013) heating demand are included. The weather data can be found in Weather\_Data\_20xx-20xx.csv.

### 2 Heuristic control parameter

Two main parameters in the heuristic control rule are the set-point temperature of the district heating (DLSP) and the required STS state-of-charge ( $SOC_{req,t}^{sts}$ ). DLSP is a function of the ambient temperature and calculated according to Eq. 1, which is based on Figure 2-4 in [1]. The values of  $SOC_{req,t}^{sts}$  for three ranges of DLSP at different time of the day are given in Required\_STS\_SOC.csv. These values were gathered from Figure 2-5 in [1].

$$DLSP_t = \begin{cases} 55 \text{ }^\circ\text{C} & \text{if } T_{amb} \leq -40 \text{ }^\circ\text{C} \\ -0.48 \cdot T_{amb} + 35.8 & \text{if } -40 \text{ }^\circ\text{C} < T_{amb} < -2.5 \text{ }^\circ\text{C} \\ 37 \text{ }^\circ\text{C} & \text{if } T_{amb} \geq -2.5 \text{ }^\circ\text{C} \end{cases} \quad (1)$$

### References

- [1] H. Quintana, A Practical Approach to Model Predictive Control (MPC) for Solar Communities, Ph.D. thesis, École Polytechnique de Montréal (2013).  
URL <http://publications.polymtl.ca/1146/>