The paper by Schoetter et al. describes the parameterisation enhancement of TEB in building energy consumption by accounting for the variety of human behaviours and compared the spatiotemporal variability of building energy consumption produced by different configurations. The paper is very informative with detailed description of the implemented enhancement. However, my major concern is the readability of the paper considering its length. I suggest publication of this paper in a revised form with the following concerns well addressed.

Specific comments:
1) A nomenclature is suggested to be added. Although the symbols are mostly explained in place, given the number of symbols used in the manuscript, a nomenclature can be more friendly to the readers.
2) Figure 2, a key component of this paper, needs to be redrawn as its current form is a bit misleading. It is clearly stated that NO interaction is implemented across different fractional building uses. However, such assumption can hardly be interpreted from this figure: it looks to the reviewer that energy exchanges are existing between mass 1 and mass 2. In addition, mass 2 should have interaction with roof while such connection is currently missing.
I would suggest a two-part figure as follows, with one part showing the separate fractional building uses and the other denoting the exchanges of energy and mass between the indoor and outdoor environments of a single building use:
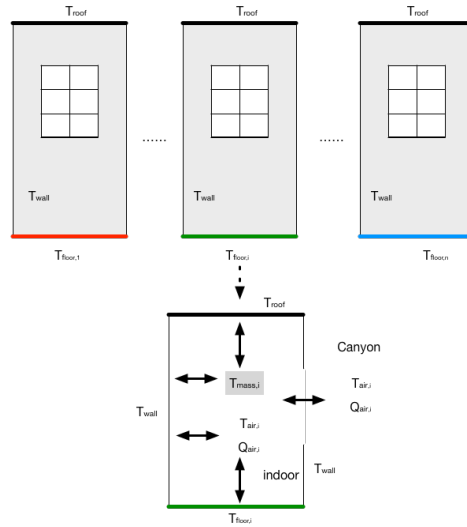
Figure 1 Re-structured schematic.

3) Figure 3: determination of dominant building types should be clarified. If fractions of two building types are comparable in one grid, which would be the dominant type?

4) Section 3.5: determination of the sub-grid fractions of building uses needs to be clarified: the current description is a bit convoluted. A flow diagram can be used to aid such description.

Technical corrections:

1) Equation 1: the formulation is very unusual. I would suggest putting R_{net} and Q_{ant} at LHS so these two become the income budgets while other three form the consumption/dissipation budgets.

2) Equation 5: the current form is very misleading. First, it is better to use a symbol to explicitly represent emissivity (e.g. ε). In addition, it is not clear to the reviewer why the emissivity is squared in this calculation.