**Description of the HP launch white house model** May 2018

**Objective**

The objective of this model is to be able to simulate what is the inside temperature of a single space house.

**Type of model**

It is a white model programmed in Matlab/Simulink. In order to calculate the inside temperature of the house the model take into account five heat flow.

1. Transmission
2. Ventilation
3. Solar Gains
4. Internal Heat Gains
5. Heating/Cooling

The model also takes into account the masa of the air inside the house and the masa of the walls.

**House characteristics data**

The document *Voorbeeldwoningen 2011 Bestaande bouw* published by Agentschap NL will be used as a reference to determine the house characteristics. The document makes a classification of the house stock per construction type (7) and year of construction (4 time periods).

Construction type

1. Detached house (*vrijstaande woning*)
2. Semi-detached house (*2 onder 1 kap woning*)
3. Terraced house (*rijwoning*)
4. Apartment block own access (*maisonnettewoning*)
5. Apartment horizontal shared access (*galerijwoning*)
6. Apartment block vertical shared access (*portiekwoning*)
7. Apartment block in general (*flatwoningen (overig))*

Year of construction

1. Build before 1964
2. Build between 1965 and 1974
3. Build between 1975 and 1991
4. Build between 1992 and 2005

For the first model we will use the data of a detached house building build between 1975 and 1991. In the following models we can use also data from other houses typology.

We can use the energy consumption sum presented in the report as the first validation mechanism for this model. In the following model development we should look for the possibility to validate the model with the use of real data.

**Climate data**

NEN 5060:2008 nl (Hygrothermische eigenschappen van gebouwen -Referentieklimaatgegevens), will be used as the climate data for the simulations. It is good to take into account that there is a new NEN5060 on the making, what can imply some changes on the results of the simulation.

**Internal heat gains data**

There is no reference document about the internal heat gains for dwelling in the Netherlands. We can consider that there are two people living in the house with an average working schedule.

**Control mechanism**

The heating will be controlled by a thermostat. The indoor temperature of the house is based on recommendation given on the ISSO publication *Kleintje Binnenklimaat.* The indoor temperature should be maintained at a minimum of 20 degrees.

We could consider taking cooling into account in the following models.

**References**

*Voorbeeldwoningen 2011* (2011) Agentschap NL, Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, Sittard,The Netherlands.

*NEN 5060:2008 nl, Hygrothermische eigenschappen van gebouwen – Referentieklimaatgegevens*. Normalisatie en normen, Delft, The Netherlands.

*Kleintje Binnenklimaat* (2015) ISSO, Rotterdam, The Netherlands.