

A comparison between a commercial energy calculation tool for buildings with calculations using a response model.

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The modeling of energy balances for buildings is a main task in building physics and a key issue in analyzing and developing new low energy buildings. On the market there exist many different calculation tools. They all have both benefits and draw backs in different cases. As a user it could be difficult to choose the most suitably tool.

In this paper a commercial energy calculation tool (VIP Energy) is compared with the relative new methodology called DTN (Dynamic Thermal Networks). DTN is developed by Johan Claesson at Chalmers. The methodology is based on response functions which gives a very illustrative picture of a buildings thermal behavior. VIP Energy is a commonly used simulation tool by consultants and designers in Sweden. VIP Energy handle full dynamic energy balances with HVAC-systems (heat-ventilation- cooling systems).

The comparison is made in the following areas:

- Accounting of thermal mass
- Handling long and short time scales
- Influence from HVAC-systems

The aim of this work is to find the most suitably tool to evaluate benefits of heavy thermal mass buildings and be able to make optimization in the construction in order to reach even more benefits of the mass. The considered benefits are; indoor temperature, low energy consumption and low installed power.

An early study shows that a combination of the two calculation tools is a good choice. The DTN methodology is to prefer to make detailed analyses and optimizations and the VIP Energy is to prefer when analyze the complete energy balance including HVAC.