

A Comparison of Energy Calculations for a Single-Family Detached Home with Two Energy Simulation Methods

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Abstract : For newly produced houses and energy renovations, an energy calculation needs to be conducted. This is done to verify whether the energy consumption criteria of the house -to reach the energy targets by 2020 and 2050- are in-line with the norms. The main purpose of this study is to confirm whether easy to use energy calculation software or hand calculations used by small companies or individuals give logical results compared to advanced energy simulation program used by researchers or bigger companies. There are different methods for calculating energy consumption. In this paper, two energy calculation programs are used and the relation of energy consumption with solar radiation is compared. A hand calculation is also done to validate whether the hand calculations are still reasonable. The two computer programs which have been used are TMF Energi (the easy energy calculation variant used by small companies or individuals) and IDA ICE - Indoor Climate and Energy (the advanced energy simulation program used by researchers or larger companies). The calculations are done for a standard house from the Swedish house supplier Fiskarhedenvillan. The method is based on having the same conditions and inputs in the different calculation forms so that the results can be compared and verified. The house has been faced differently to see how the orientation affects energy consumption in different methods. The results for the simulations are close to each other and the hand calculation differs from the computer programs by only 5%. Even if solar factors differ due to the orientation of the house, energy calculation results from different computer programs and even hand calculation methods are in line with each other.

Keywords : energy calculation, energy consumption, energy simulation, IDA ICE, TMF energi

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