

designPH – 3D passive house design tool

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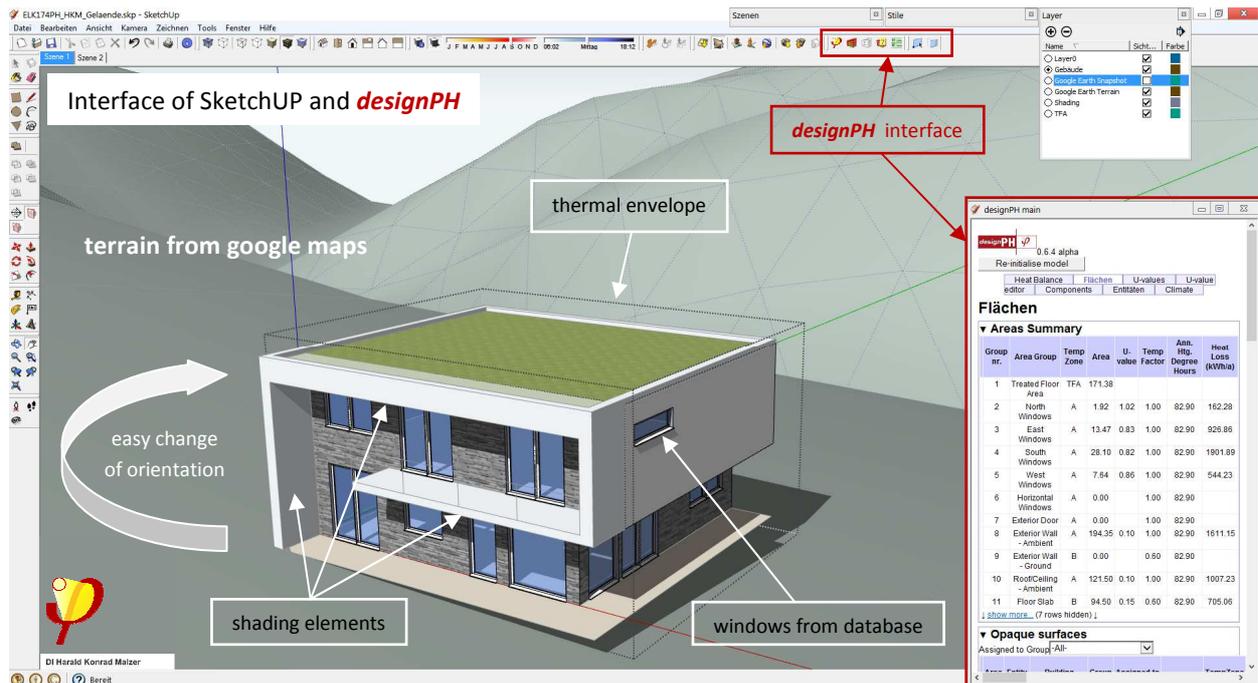
designPH is a plugin for Google/Trimble Sketchup which allows you to design Passive House projects in 3D and import the model directly into PHPP (Passive House Planning Package).

The new generation of architects is very familiar with 3D design tools. The issue of energy efficiency at the very first design process still stays at background and is often dealt with too late, thus leading to high end-costs and is sometimes not aesthetically pleasing.

In order to plan highly efficient passive houses, the PHPP was developed as a high quality and detailed tool for thermal calculations. The input of geometrical data, like surfaces, windows and shading elements, remains long and can induce errors. Therefore, a visual feedback makes the tool much more user-friendly and facilitates the control of mistakes - and it is much more fun!

This certainly led to the combination of the well-spread 3D designing tool “SketchUp” with the high quality calculation of PHPP. In this way, the issue of energy efficiency comes to the fore, right in the moment of designing.

designPH has been developed to work together with PHPP as a simplified way to enter all the geometric data necessary for building energy computations. Now it is possible to just sketch a building using the easy-to-use software “Sketchup” and then export geometric data into PHPP. The tool will also calculate a preliminary energy balance within Sketchup, so it can be used as a pre-planning tool to refine the energetic-design before going to the next step in the design process and final calculation in the PHPP.



The presentation will provide an overview of the features that have been developed so far, such as entry of the geometry of building envelope, thermal bridges and window dimensions as well as the entry component properties such as U-values or climate data, and this in addition to the final export to PHPP.

It becomes obvious how easy it is to optimize a design by orientation, amount and quality of glazing and integration of shading elements to get the design closer to the Passive house standard.

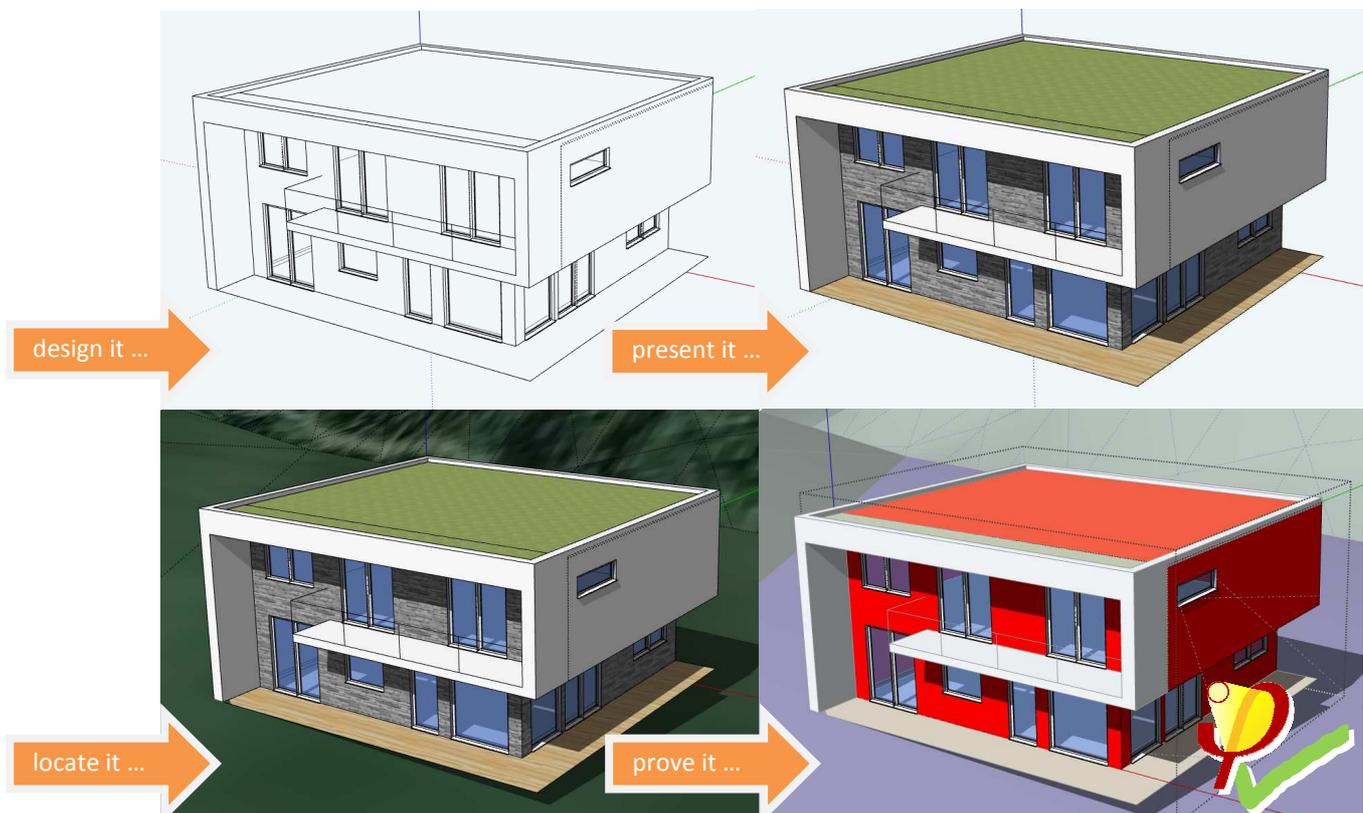
Features of the tool:

- Automatic (and user defined) detection of thermal envelope and of the treated floor area, including the possibility to assign different U-Values
- The tool is able to detect shading elements and organize them into three types: horizontal shades (like balcony), vertical shading (walls, reveals) and horizon shading (like mountains and neighbouring buildings) including the geometrical export directly into PHPP
- It is possible to select thermal bridge-elements of the building in the SU model and export the values directly to PHPP. This way the issue of thermal bridges becomes much easier to control.
- Database to enable selection of the type of windows, glazing and walls directly in designPH
- Pre-selection of the climate data

Outlook on Future-Features:

- improvement of complex building geometry
- positioning of solar thermal or photovoltaic panels
- geometric data entry of ventilation units or ventilation concepts in general
- positioning of reservoirs, pre-calculating of warm water distribution losses
- real-time calculation based on PHPP

Workflow with Sketchup and *designPH*:



Workflow in detail with Sketchup and *designPH*:

