

New features in the Passive House Planning Package 10 (2021)

The new edition of the PHPP includes additional evaluation methods and auxiliary calculations. The input fields, worksheets and the manual have also been reorganised and restructured. The **Import-Export** tool provided in the form of a macro was also further developed and supplemented with a separate macro to update components and climate data. An additional tool was developed to assist with data input of the different surfaces and volumes.

In general, the following changes have been made in the PHPP 10:

File format	The PHPP 10 will continue to appear in the commonly used Excel format *.xlsx. PHPP 10 is not compatible with the previous Excel file format *.xls or with Excel 2003.
Worksheets	Two new worksheets have been added: Moni and Addl Vent 2 . The Overview worksheet that was hidden in PHPP 9 was further developed and activated.
Input assistance	To input specific data such as the treated floor area or the ventilation volume, a set of secondary calculations have been prepared and provided through the Room Data tool.
Headers	The header of all worksheets has been simplified and highlighted with different colours for better orientation.
Cell formats	The formats of the input and result cells have been reduced for a better overview and clarity.
Additional tools	PHPP 10 is supplemented by additional tools, which support on the one hand the compilation of input data and on the other hand, the documentation of changes in the results during the course of the project.
designPH	designPH has been further developed and is also available for 3D-data input in PHPP 10.

The following worksheets have been revised or supplemented:

Results

Verification The input or selection of project settings such as building use, energy standard or number of occupants was restructured.

The additional requirement for the cooling load in hot climates is no longer applicable. Recent studies show that an extremely small cooling load results anyway if the requirement for the cooling and dehumidification demand is met.

For moisture protection, a minimum requirement for building components based on the relative air humidity was implemented.

For EnerPHit retrofits, specific values of building components are now also available for different temperature zones.

Variants This worksheet was supplemented with input variables for renewable energy generation from solar thermal systems and photovoltaics.

PHeco From PHPP10 onwards, the tool **PHeco** is a worksheet in PHPP to be used for economic calculations related to the energy efficiency measures in buildings.

Check With new or adjusted plausibility checks.

Overview This worksheet has been redesigned and further developed, including new result charts, and a column to export data which enables the transfer of relevant information into the Passive House project database.
User-defined text in additional languages can also be entered here.

NEW: In this worksheet, the PHPP calculation can be adjusted to actual boundary conditions
Moni such as weather data or room temperatures, in a given measurement period in order to make the actual consumption values comparable with the calculation results in the PHPP.

Building inputs

Climate The input of a temperature increase in the summer was added to evaluate thermal comfort even under warmer weather or climate conditions, for example in inner city locations.

Climate datasets for locations worldwide were added and updated.

The format for the climate data has been extended and the design temperature for the thermal comfort criterion is now part of the datasets.

U-values The inputs for U-values of a building assembly can now be copied as a block to be inserted on a different assembly or into other PHPP files.

The secondary calculations for U-values have been rearranged for a better overview and several are now possible in each case.

A secondary calculation for more complex building assemblies with a many layers or sections has been added.

Other new features are the secondary calculations for the influence of temperature on the lambda value and to determine a U-value supplement for mechanical fasteners.

Areas There are three additional area groups with different user-defined temperature reduction factors for building assemblies adjacent to zones heated to a lower temperature. A secondary calculation is available for determining these factors.

For thermal bridges, a warning message is now displayed for low surface temperatures, which also depends on the relative indoor humidity.

A secondary calculation to estimate the thermal bridge coefficient from interior drain pipes that are ventilated through the roof is provided.

For projects in the southern hemisphere, mirroring all building assemblies at the equator as required in PHPP 9 is no longer necessary. The conversion of the solar radiation available based on the orientation of the building assembly is automatic.

Ground The estimation of the energy flows through floor slabs or basement ceilings for locations in temperate climates has been improved.

Components This worksheet now includes new component categories for heat pumps and combined ventilation and split units.

For ventilation units, the parameters for heat and humidity recovery for the cooling period / summer were added.

The specific data for windows has been extended to have entire window systems, which allows the input of windows with multiple panes with mullions or transoms.

The percentages of individual components in relation to the total area groups are now shown.

A filter function for certified components allows to reduce the selection options to only those components which are suitable for a given climate.

Windows The input of transparent components was extended and now also allows the input of windows with multiple panes or curtain wall façades in a single row. In this way, values for threshold profiles or the geometry of different frame sections can also be entered.

The option to input a position number was added to the window description in order to improve the allocation of windows to the corresponding design documents.

The comfort criterion for transparent building components was updated based on new findings.

The diagram with the balance of the radiation gains and transmission losses is now also provided for the summer period.

Ventilation The heat and humidity recovery in summer from the device can now be taken into account for the operation of the ventilation units.

The input and results of multiple ventilation units in the worksheets **Addl vent**, **Addl vent 2** and other worksheets, is now summarised in the **Ventilation** worksheet.

NEW: Copy of the **Addl vent** worksheet to enter additional ventilation units in the case of **Additional vent 2** very large or complex projects. If required, the worksheet can be copied several times. The results in these worksheets will then be summarised in the **Ventilation** worksheet.

Inputs for the cooling case

Summer This worksheet was supplemented with a stress test for summer comfort when passive cooling concepts are used. Summer comfort and the frequency of overheating are greatly dependent on the behaviour of occupants in the building, which influences factors such as air exchange via windows in the summer, night ventilation, temporary shading or internal heat gains.

Besides a set of pre-defined risk parameters, the manual input of different user behaviours is also possible.

Cooling units This worksheet has been restructured.

The seasonal energy efficiency ratio of the cooling units can now be determined more accurately based on the device properties.

Other types of operation, e.g. combined supply air and recirculation cooling via the ventilation system were added.

Two different operation modes can be considered for supply air and recirculation cooling: optimised for cooling or for dehumidification.

Inputs for the PER / PE - Value

DHW+Distribution The concept for heat delivery can be indicated here to do a plausibility check for the stated forward flow temperatures.

A distinction is now made between summer and winter when calculating the domestic hot water and space heating losses.

Different forward flow temperatures and other settings can now be entered for each column or for each pipe section. In this way, different distribution systems can be considered and the input of systems with heat interface units is now also possible.

Domestic hot water circulation in residential buildings is now assumed with a standard operating time of 24h/d; and the input of the number of occupants per day for the

domestic hot water requirements has been added for cases where it differs from the average occupancy in the PHPP.

A new diagram provides graphical information about the energy expenditure for hot water generation and distribution losses.

SolarDHW This worksheet can now be linked to the variant calculation. Specific variant parameters have been defined and can be activated on the left side of the worksheet.

PV This worksheet can now be linked to the variant calculation. Specific variant parameters have been defined and can be activated on the left side of the worksheet.

Electricity This worksheet was restructured and the inputs to calculate the energy demand when devices are not in operation (e.g. standby mode) were added.

The standard values and the input structure for most household appliances were updated to current efficiency standards. The calculation of the electricity demand from small devices and electronics was extended.

The sum of the electricity demand for the different energy uses is displayed in the lower part of the worksheet.

Use non-res The input for utilisation profiles was supplemented with information about the relative presence of persons.

Up to 60 user-defined utilisation profiles can be specified.

Electricity non-res This worksheet was restructured. For office buildings, it is possible to select standard electrical devices for the calculation.

The sum of the electricity demand for the different energy uses is displayed in the lower part of the worksheet also in the form of a graph.

Aux Electricity This worksheet was restructured and supplemented with several options for user-defined inputs.

IHG For the calculation of internal heat gains, the difference between distribution and storage losses in summer and winter is now considered.

It is also possible to enter some user-defined values for any unforeseen heat gains.

IHG non-res As for residential buildings, the difference between distribution and storage losses in summer and winter is now considered.

In the same way, it is also possible to enter some user-defined values for any unforeseen heat gains.

For internal heat loads from occupants, several rows have been added to allow for a differentiated input.

The resulting heat loads from the various internal sources are clearly displayed through a graph the lower part of the worksheet.

PER In the **PER** worksheet, the selection of up to 4 different heat generators is now possible, thus allowing a differentiated input for more complex projects.

The calculation of the biomass budget was revised.

For residential and office buildings, the determination of a project-specific primary energy requirement was added. This requirement is considered in the case of buildings with high occupancy density.

HP This worksheet was redesigned and now uses the device data from the **Components** worksheet.

It is now possible to take into account systems with recirculation heating and air-to-air heat pumps.

District heating The calculation of the efficiency of the district heating network now takes place separately for summer and winter.

The PHPP 10 also contains additional tools (separate Excel files):

PHPP Tools The following tools have been integrated into an external file:

- Import-Export interface
- Import (PHPP9 to PHPP 10)
- Profile settings
- XXL: to add rows
- **NEW**: Components update
- **NEW**: Climate update

NEW: The **Room Data** tool allows the systematic determination of essential input variables for the PHPP providing assistance especially for complex projects. It can easily be extended and adapted depending on the requirements of the project. The calculated intermediate results can be transferred into the PHPP.

This file contains templates for secondary calculations to the PHPP in different worksheets. It also serves to document changes in the calculations, which is very useful for communication among those involved in the project.

Apart from this, the file also includes the **Record** worksheet which is a systematic record of changes during planning, and their impact on the main energy efficiency results of the building, thus making them traceable.

NEW: This file is, so to speak, the **Room Data** tool for small, simple buildings. The secondary calculations it contains serve as documentation and subsequently allow fast and uncomplicated data input into the PHPP.
