

Step-by-step retrofit to achieve EnerPHit-Standard, the example of a single-family home

Retrofit Plan? Retrofit Plan!

Currently, many retrofits are carried out as individual measures not taking into account further improvements to be implemented in the future, nor involving an architect. As a result, sustainability objectives are not achievable, any energy-saving potential is gone to waste, and unnecessary costs are generated. To change this, Passive House players are needed to create a long-term retrofit plan, in which the objectives are clearly defined together with the owner. For this, one can turn to the professionals with the relevant skills, for example, the certified Passive House Designers.

Certification? Certification!

To support this approach, the Passive House Institute offers the possibility to pre-certify the first step of an EnerPHit step-by-step retrofit. For this, it is necessary to submit an energy balance with the Passive House Planning Package PHPP 9 (2015) and a so-called EnerPHit Retrofit Plan. These should state that at least 20% of energy savings are achieved through the retrofitting steps. Therefore, independent quality assurance is also available in step-by-step retrofits. This is offered by all certified Passive House Designers.

Example: Step-by-step retrofit of the Franconian residence „Sonnenstrasse 39“

The house had two previous renovations in the years 1999 and 2004, when insulation was added to the roof, and the windows, floors and bathrooms were renovated. But, until the winter of 2013/1014, there was no overall plan for these renovations. Then, one of the tasks was to implement a plan that would take the renovations back into the track to achieve the EnerPHit-Standard. These included insulating exterior walls and the basement ceiling, improving airtightness, as well as installing a ventilation system with heat recovery. In addition, the old heating system and two gable windows were replaced. The achieved results in PHPP were an eye-opener, a long-term strategy is needed. In particular, airtightness was completely neglected in earlier renovation measures. But today, even though the

building only fulfils around half of the EnerPHit requirements, the inhabitants are satisfied due to the high comfort and the very low operation costs. And the investor is also very pleased with the increase in property value.



Photos: before renovation after renovation

Apply the principle - „If you do it – do it right“

Given the fact that the exterior walls represent a significant portion of the envelope surface in single-family homes, the thickness of the thermal insulation should not be spared. Even if the U-value is only slightly improved by the additional cm of insulation, this component has, overall, a considerable, positive impact in the energy balance.

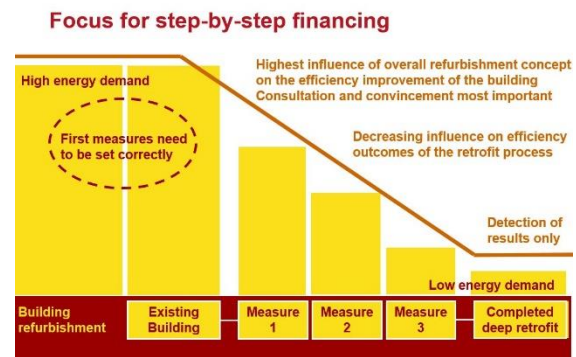


Figure: Step-by-step retrofitting to the EnerPHit Standard

Very typical: Huge influence of typical thermal bridges on the energy balance

Four variants were reviewed: before the retrofit, after Step 1, a future Step 2 (window replacement) and the end goal – achieving „EnerPHit“. The analysis shows that thermal bridges are not negligible and should be eliminated/dealt with, whenever possible.