Cost effective renovation of residential buildings: If you do it, do it right!

We need action: to renovate the building stock, to counteract rising energy costs and to protect the climate – but building owners face significant challenges due to rising construction costs, inflated prices for heat pumps, a shortage of qualified skilled workers, etc. But here's the good news: **it's not that hard!** That's because the Passive House principles, planning tools and components already used in new construction can also be utilised effectively for building modernisation.

The solution is EnerPHit

Using real-life examples, the **Research Group for Cost-effective Passive Houses** has demonstrated that building renovations with Passive House components lead to energy-efficient, cost-optimised solutions tailored to each building. The overall costs are a measure of this. Increased construction costs can be offset by the saved energy costs; the low energy consumption makes users more independent of crises. There are many affordable actions that are good for occupants and the climate as well.

The Research Group **Protocol Volume No. 62 "Cost-effective renovation of residential buildings"** can be found on Passipedia under "Publications". The recording of the session is also available (in German) under **"Passive House videos"**. Both are free of charge.

When is the right time?

The right time to carry out energy-efficient improvements is whenever a building part is due for renewal – then it must be done properly. In this way, even if done step by step, the best possible outcome can ultimately be achieved for an existing building. This is also made possible by the large number of quality-assured Passive House components that are now available (see also componentdatabase.org).

Which measures?

The free online version of ENBIL offers an attractive starting point, also for those interested in building construction. This program generates an energy balance and suggests suitable measures for the building, which are assessed for both energy efficiency and cost-effectiveness. The resulting PHPP dataset can then also be used for detailed planning by an energy consultant.

As part of the **"Efficiency NOW!" campaign** (Passipedia), the Passive House Institute has compiled some exemplary renovation measures. Here you will find information on the basic principles of building physics as well as detailed instructions and documentation for efficiency measures.

Many solutions for home ventilation

A ventilation system is an essential part of good, healthy and safe building modernisation. Suitable, highly energy-efficient devices adapted for existing buildings are increasingly being developed, along with a variety of design solutions (such as cascade ventilation or façade-integrated ventilation). The principles for success are: as little technology as possible, but as much as necessary, and a focus on simple, robust systems. Highly efficient ventilation units with heat recovery and low power consumption make for high seasonal performance factors. Rainer Pfluger of the Austrian University of Innsbruck provides a detailed overview of this in his article in the Protocol Volume No. 62.

The future of heating and cooling

The lower the energy demand and heating load are, the simpler the technical solutions will be. Either sustainably supplied district heating or efficient heat pumps will be the future-proof solutions for renovated existing buildings. The split-system air conditioning unit for heating and cooling has proven to be a very cost-effective solution. It can be used in single-family houses as well as apartments in well-insulated buildings, e.g. when the indoor unit is centrally located in the corridor.

Protocol volume 62 shows that the challenges posed by the energy transition can also be met by existing buildings. Optimal thermal insulation of the building envelope and a quality-assured ventilation system with heat recovery are decisive for this. This reduces the heating load and consequently, the required output of a heat pump. **As Wolfgang Feist puts it: "Do whatever makes sense in each specific situation – that's the most cost-effective approach. And: EnerPHit is the method for finding that most cost-effective solution."**

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