Part 3: The new Passive House Classes based on the PER system and their implications

The Passive House Institute has introduced new Passive House Classes. The criteria for the space heating demand and airtightness remain unchanged; the primary energy demand has been replaced by the renewable primary energy demand (PER demand) which evaluates the building in a scenario where fossil energy sources are no longer used. Passive House buildings are categorized into different classes based on their PER demand and their PER generation. Thus, a Passive House Classic is a building with a total energy demand of less than 60 kWh/(m^2_{TFA}a) PER. A Passive House Plus requires ≤ 45 kWh/(m^2_{TFA}a) PER and must also generate ≥ 60 kWh/($m^2_{projected}$a) energy. This energy generation is based on the projected building footprint, as described *in iPHA – Passive House Fact Sheet 2015/4 Part 2*. The most ambitious class for Passive House buildings is Passive House Premium where the PER demand is ≤ 30 kWh/(m^2_{TFA}a), and generated energy must be ≥ 120 kWh/($m^2_{projected}$a).

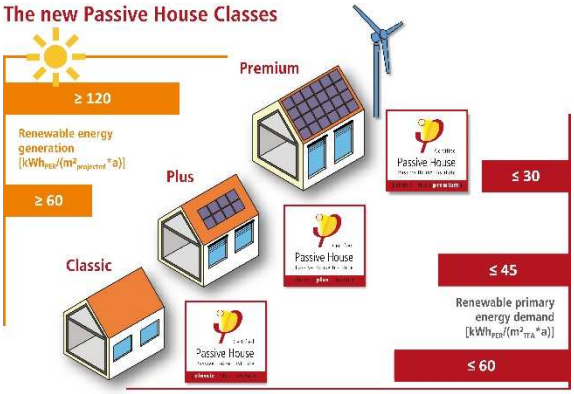

Illustration: PER demand and PER generation in relation to the Passive House Classes Classic, Plus and Premium

Renewable energy generation is not necessary for achieving the Passive House Classic category. However, if energy is produced, then with appropriate energy generation the building can have a PER demand of 75 kWh per m² of treated floor area a year and may still be certified as a Passive House Classic. Within certain limits, a higher renewable primary energy demand can therefore be compensated through higher renewable energy generation. This principle also applies for the Plus and Premium classes. Here, a reduced demand can compensate for less energy generation.

Example: Passive House Freundorfer, Oberaudorf (Germany)

For the reference case, the single-family Passive House Freundorfer is heated by means of a manually operated wood-fired stove which is used in combination with a 6 m² solar heating system with buffer storage for hot water and heating. Heat distribution takes place via supply air. The building is extremely efficient with a space heating demand of just 8 kWh/(m²a) and a PER demand of 42 kWh/(m²a). With regard to the demand, the house achieves the Passive House Plus Standard, but energy generation via the solar heating system is too low. This obstacle can be overcome if the unused parts of the south-facing roof are covered with PV modules. For optimisation to the Premium Standard, the heating system will need to be modified. By using an air-to-water heat pump in place of the wood stove and the solar heating system, it will be possible to save 11 kWh/(m²a) PER. For the necessary increase in the energy generation, wall or garage surfaces can be covered with photovoltaic panels, or alternatively the building owner can invest in a new wind power plant. For a successful transition to sustainable energy, it is essential to make use of capacities for renewable energy generation. Whether or not these are associated with the building is less significant. For this reason, renewable energy that is not generated on the building can also be accounted for, provided that new systems are used.

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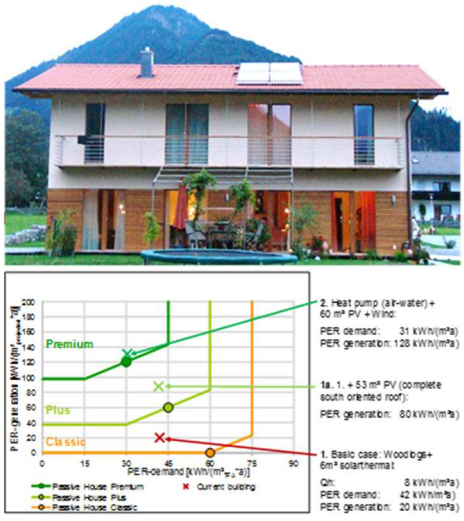

Further information and sources

www.passipedia.de

Krick, Benjamin: Classic, Plus, Premium: Die neuen Passivhausklassen und wie sie erreicht werden können. In: Feist, Wolfgang (Hrsg.): Tagungsband zur 19. internationalen Passivhaustagung 2015 in Leipzig