

WP4.3. Energy Performance Gap in building retrofit

Potential impact on the Swiss Energy Strategy 2050 (for Geneva)

Khoury Jad, Hollmuller Pierre (University of Geneva)

In the second part, preceding relation is used to assess a realistic energy saving potential for Geneva's multifamily building stock, for which the measured final energy consumption for heating (SH and DHW) as well as the associated heated area of the multifamily residential buildings are known (Fig. 3). In order to take full advantage of the theoretical saving potential of post-war buildings (677 GWh/yr), the median space heating demand of these buildings (363 MJ/m²/yr) would need to be reduced by a factor of no less than 3.5. Figure 3 also shows that the reduction objectives vary greatly from one building to another, depending on the situation before retrofit.

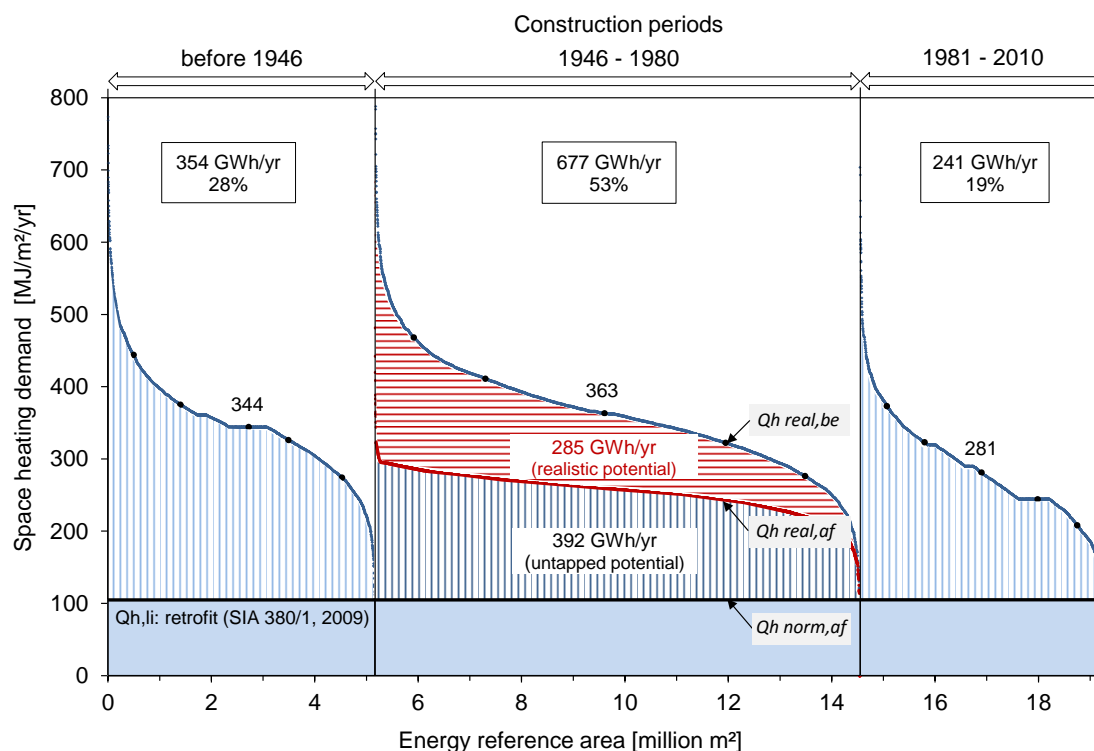


Figure 3: Sorted space-heating demand of the Geneva multifamily building stock, and realistic energy saving potential under current retrofit and operation practice.

If the performance of the analysed post-war buildings, retrofitted during the period 2005-2009, is extrapolated to the entire stock, the realistic energy saving potential under current practice can be estimated by way of the equation 1. This potential, which amounts to 285 GWh/yr, represents 42% of the theoretical potential calculated by way of the SIA 380/1 limit (Figure 3, red hatched area).

This means that, even if the financial resources for retrofitting of these buildings are provided and all associated obstacles are removed, almost half of the theoretical potential will remain untapped unless current practices and use relating to building retrofit are evolving. Furthermore, since a low theoretical saving potential results in an even smaller actual saving, the future retrofit of buildings with low space heating demand might become less significant.

Similar results were obtained at national level for different building categories, making it difficult to achieve the ambitious goals of the ES2050. In this regard, the primary issue not only concerns reducing of the space heating demand of buildings in order to satisfy ever more stringent energy requirements, but also to reduce the difference between theoretical and actual energy savings.