Policy brief: Energy Efficiency and Refurbishment Strategies in Buildings

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POLICY BRIEF

Energy Efficiency and Refurbishment Strategies in Buildings

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Key messages

- *In the buildings sector, there is still a vast potential for cost-effective energy-efficient refurbishment measures.*
- *However, there is a wide spectre of energy-efficient refurbishment measures, ranging from very low-cost and cost-effective measures to measures with high marginal costs. Thus, planners and building owners need to carefully assess building conditions and context to balance demand-side efficiency and heat supply options.*
- *The current trend of high energy carrier prices increases the potential of cost-effective energy-efficiency measures (even though they are also increasing their costs).*
- *Policy interventions should focus on either the refurbishment depth or the refurbishment rate for existing buildings. However, both interventions are needed to address the full potential of existing EE measures.*
- *If high building codes are already implemented for new buildings, policy interventions should address the refurbishment rate of existing buildings rather than the refurbishment depth.*
- *Increasing the rate of low investment costs refurbishment measures such as insulating ceilings and basements can help to achieve higher EE targets earlier in time.*

Key findings and key recommendations

Facts and aspects linked to the application of the EEFP in this sector and synergies between sectors included in this project:

1) About 1 PWh or half of the energy savings achieved in the buildings sector is a result of end demand savings due to building stock refurbishments and the other half is a result of system redesign measures and changes in the heat supply.
2) The most cost-efficient measures for building refurbishment considered are simple measures such as improving roof and basement insulation, which usually do not need high additional investments for scaffolding or sockets. However, to tap the full additional savings potential, these measures are not sufficient if the refurbishment rate cannot be increased by relevant factors.
3) A reduction in heat demand of 40% for existing residential and service buildings is needed from 2020 to 2050, which is equivalent to 1.3-1.4% absolute heat reduction per year.
4) To achieve higher EE targets, one needs to address both, the refurbishment depth as well as the refurbishment rate. Additionally, different building age classes need to be addressed by specific refurbishment policies.
5) Deep refurbishment needs to be implemented in the first step to avoid additional costs due to double work. This means that buildings that are foreseen for refurbishment anyway need to be refurbished at deeper levels to avoid these buildings needing to be refurbished in a short time afterward to achieve lower energy demand levels.
6) The introduction of low investment cost solutions, high-efficiency materials, and/or the promotion of standardized refurbishment procedures help to reduce architectural, technical, financial, and regulatory barriers.
7) Non-energy-related benefits of refurbishment measures need to be better understood to be quantified and therefore can be promoted as supporting impact for the implementation of such measures. Yet there are indications that non-energy benefits might be even higher than direct energy benefits.

Tool Box – Visualisation, Exploitable Tools, and Data from WP1

- The **database** provided (accessible on the web page https://www.seenergies.eu/) allow us to quantify and compare on the single building level different refurbishment strategies for different building and countries, including a comparison with benefits related to reduced heating system investments. Depending on the refurbishment case, the cost savings on the heating system vary.
- The **review of non-energy-related benefits** allows for specifically targeting further research in this field of work (report accessible on the web page https://www.seenergies.eu/).
- The improvement of the **FORECAST model** and the respective scenarios calculated help to compare the cost-effectiveness of refurbishment measures and investments in renewable energies (link to WP6). The enhanced FORECAST model is being used in follow-up projects, e.g., in collaboration with NGOs, policymakers, and energy utilities.
- The data delivered is used to **map the heat demand and efficiency potentials for different building categories** and age classes in the built environment (link to WP5). GIS-based analyses are possible for e.g., EE potentials on the hectare level.

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