

“INPUT PAPER”

by the Energy Efficient Buildings Committee of ECTP
to the SET-Plan Action n°5 “Issues Paper” on
“Develop new materials and technologies for energy
efficiency solutions for buildings”

Dear Mrs Strachinescu, dear Mr Hodson

We thank you a lot for the opportunity to comment on the **Issues Paper for the SET plan Action 5 aimed to develop new materials and technologies for energy efficiency solutions for buildings.**

In line with the goals of the Energy efficient Buildings contractual PPP (EeB PPP), this document sets the development and strengthening of energy-efficient components and systems as priorities. The reduction of costs, the definition of highly replicable packaged solutions and the industrialization of plug and play components and systems are explicitly targeted.

In this framework and in line with the inputs provided by the Energy Efficient Buildings (E2B) Committee within ECTP, formerly E2BA, we would like to provide you below with our overall comments on the core parts of the documents, targeting both existing and new buildings.

Existing Stock

Considering the ambition in terms of energy demand reduction, the very low current energy retrofit rate (stressing the low attractiveness of deep energy retrofit, considered independently from owners' fundamental motivations for building transformation) and the limited information available on the existing stock, the proposed technological vision and roadmap could be advantageously completed by the following:

- Development of decision aiding methods and tools integrating deep renovation in a holistic and step-by-step framework, constrained by the owners' fundamental motivations for building transformation (i.e. first immediate renovation needs and in a 2nd stage needs related to replacement and maintenance cycles, for example). These motivations and associated cycles represent the “engine” for further building stock transformation. There is a key issue in creating opportunities for refurbishing when other actions are already taken or decided.
- Development of methods and tools to identify the potential energy savings in relationships with low investment, but with very short ROI actions and strategies (building equipment settings and controls). Although these will not be sufficient to reach ambitious targets in terms of energy savings, they still represent a potential to be captured on the short term.
- Consolidation of energy assessment tools, to favor robust assessment from limited input data. On the existing stock, the characterization of building components and systems generally remains limited. The assessment tools have to deal with this constraint and still provide robust assessments.

- ECTP-E2B considers there is a strong necessity to integrate moisture risk analysis in each refurbishment project.

New Building

The document as it stands only addresses the energy consumption during the use phase to go towards NZEB. It should also consider the embodied energy and the energy induced by transport to access or to leave the building. The concept of Life Cycle Analysis should be used to assess the performance of the building in energy and CO₂ emission.

The gap between predicted and measured energy is mentioned, but it should be highlighted that answer(s) are under development and still need R&D support, as well as pilot and demonstration actions.

Especially about the knowledge related to the part of the energy use that is not directly concerned by energy efficiency regulation at building level (e.g. in the tertiary sector, all ICT equipment):

- the internal gain is poorly appreciated,
- thus the overall building energy behavior is poorly predicted, whereas at the same time:
 - energy efficiency incentives at product level (EUP, Energy Star etc...) are not linked with the building level,
 - the relative value of this “black” energy is becoming dominant in new building.

There is a clear opportunity to tackle this lack of method and knowledge by a mix of statistics, ICT and new services.

The energy performance of building(s) is never proposed to be assessed in this document in a larger framework considering the energy performance of a neighborhood, a city, a territory... This is inconsistent with technologies that deal with several buildings in order to benefit from mutualization. It leaves besides the latent value of coordination between the building sector and the infrastructure sector (building is only one component in a larger system that should be thought in a planification framework): there is no chance that the optimum of the system is the sum of all local optima. It also ignores completely actors in charge of a territory or in charge of several buildings located in a same area or dispersed.

When we consider more detailed aspects we have below gathered our punctual comments making reference to the key sections of the document as follows.

Chapter 2: Context and policy objectives

The figure concerning the saving potential of new buildings (“less than a third”) is overestimated for the Western part of Europe where new buildings only accounts for around 5% of the building stock. In these countries, replacement of existing buildings by new buildings is a quite marginal phenomenon. In France, less than 1% of the building licenses delivered are related to the replacement of an old building by a new one. Furthermore, there is no massive urbanisation nor rapid expansion of the tertiary sector in the EU, such as in India, China or Brazil.

Chapter 3: Obstacles to increasing energy efficiency in buildings

When we consider financial barriers, the increase of building performance is much more important both for European citizens and for the Union than how close the better European buildings are from the NZEB target. It is much more efficient from an economical as well as from a social point of

view to renovate poorly insulated buildings than improving already efficient buildings to reach NZEB level.

When we consider technical barriers, in particular moisture, this is a major issue for more than fifty years old buildings. Not taking care of thermo-hygrometric conditions can lead to “moisture catastrophe”, which prevents some owners to engage into renovation operations. To clear this obstacle, R&D has to be carried out to improve thermo-hygrometric conditions of a building and develop specific dedicated solutions. The current paper does not include any action to address this issue.

When we consider cross-cutting barriers, a large part of the retrofitting companies are SMEs or even very small companies. There is a missing link between craftsmen and building owners. Medium-sized companies could benefit from greater support to become “trustworthy third-parties”, helping owners to make informed decision and helping these small companies to keep aware of new products and services.

The lack of knowledge about the potential benefit of retrofitting is another important barrier. In order to contribute to clear it, it is essential:

- to have a much better understanding of the initial status of the building. A good diagnosis is a mandatory condition to use the right technological and methodological tools during renovation;
- to be able to assess the quality of the retrofitting and to be able to evaluate potential defects or poor workmanship;
- to analyse building tenant behaviour before and after retrofitting. Often, tenant behaviour is significantly modified due to the retrofitting (rebound effect) thus distorting the evaluation of the actual impact of the renovation.

These 3 points are not linked together. Specific R&D actions have to be conducted on each of them.

Last but not least, BIM (Building Information Modeling) does not seem to be mentioned in the document. It is probably the biggest revolution in construction that is allowing to optimize design, (de)construction and exploitation and phases. So we think it should be given the place it deserves for improving energy efficiency.