

## Public consultation on the Energy Performance of Buildings Directive

### PU Europe Reaction

#### A. Overall Assessment

##### 1. How successful has the EPBD been in achieving on its goals?

The EPBD was successful in that it fixed a medium-term pathway towards nZEB for new buildings, which launched a process of change in the construction sector. While some Member States would have moved in that direction without EU legislation, others would have been unlikely to take bold steps. The cost-optimality method, although not always correctly implemented, triggered a useful reflection process at the level of national regulators as to the ambition level of building regulations. However, due to delayed or incomplete implementation and a slowly adapting construction industry, the goals have not been fully achieved and the savings potential from renovation remained largely untapped.

##### 2. Has it helped improve energy efficiency in buildings?

With the step-wise development towards nZEB, the energy efficiency of new buildings has significantly improved in most Member States.

A report published by the Odyssee MURE project concludes that the efficiency of household space heating, measured in kWh or GJ/m<sup>2</sup>, has improved steadily since 2000, by around 2.3%/year at EU level. The reasons include the deployment of more efficient new buildings and heating appliances, and the renovation of existing dwellings. However, a huge potential remains untapped and may be locked in by shallow renovation.

**Reference:** [http://www.odyssee-mure.eu/publications/br/energy-efficiency-in-buildings.html?utm\\_source=newsletter&utm\\_medium=email&utm\\_campaign=%5BODYSSEE+Newsletter+June+2015](http://www.odyssee-mure.eu/publications/br/energy-efficiency-in-buildings.html?utm_source=newsletter&utm_medium=email&utm_campaign=%5BODYSSEE+Newsletter+June+2015)

##### 3. Has it helped to increase renovation (more than 25% of the surface of the building envelope) rates?

If this refers to "major renovations", there is no evidence that renovation rates and the depth of renovation have increased. Available data suggest that the annual renovation rate still remains at around 1%, when it should be at around 3% and focus on (staged) deep renovation to ensure that the EU achieves its objectives.

Most renovation projects leave cost-effective savings potentials untapped. There are no data to show whether major renovations systematically achieve compliance with minimum performance requirements or even go beyond.

##### 4. In your view, has the EPBD sufficiently contributed to accelerating investment in improving the energy performance of the EU's building stock? Why/Why not?

The EPBD has triggered significant changes in most Member States. Researchers and industry have developed innovative solutions to meet nZEB requirements.

This development was most successful in countries / regions with clear legal requirements and well-defined pathways towards nZEB. Delayed implementation, changing policy priorities and stop-and-go support schemes represent the main stumbling blocks.

As regards investments in building renovation projects, the EPBD contribution was very limited. This is mainly due to the fact that it contains little binding requirements in this regard. It is widely acknowledged that the current renovation rate of 1% is far too low and the depth of renovation insufficient to ensure that we achieve an nZEB-level building stock by 2050.

#### **5. Overall, do you think that the EPBD is contributing to cost-effective improvements of energy performance? Why/Why not?**

To some extent it does. According to the EPBD Concerted Action, there has been a positive 25% improvement of the overall energy performance of new buildings since the first EPBD.

Additional costs for building to low energy / nZEB standards have come down in Member States with a clear and supportive political framework thanks to new product / system developments and economies of scale. Consequently, pay-back periods for super-efficient buildings have substantially shortened.

The situation is unclear as regards existing buildings. Related EPBD provisions are less stringent and a substantial part of the cost-effective potential is left untapped. Lower energy prices give the impression that energy renovation becomes less relevant.

#### **6. Do you think that the aim of ensuring the same level of ambition across the EU in setting minimum energy performance requirements within the EPBD has been met? Why/Why not?**

The EPBD leaves significant flexibility to Member States regarding cost-optimality and nZEB definitions. This led to a wide disparity of requirements mainly for new buildings. From that prospective, the ambition has not been met.

On the other hand, it is important to leave some freedom to Member States to take account of climatic conditions, building traditions and specific use patterns.

The revised EPBD should ensure that countries with similar conditions show similar ambition levels.

#### **7. Has the EPBD effectively addressed the challenges of existing buildings' energy performance?**

The EPBD's current focus is on new-build. The challenges of existing buildings are not adequately addressed. This needs to change in the revised directive.

According to Commission figures, 70% of our buildings are still inefficient. In the absence of a long-term vision for the entire buildings stock, and of specific trajectories for individual buildings, renovation is still conducted at sub-optimal levels in the majority of cases. This issue could be addressed through:

- Ambitious and binding renovation strategies based on art. 4 (EED);
- High-quality building passports (based on the energy performance certificates);
- Developing one-stop-shops to address the main barriers to building renovation, notably access to financing;
- Better enforcing implementation of national transposition laws, notably by promoting on-site controls.

#### **8. Has the EPBD set effective energy performance standards for new buildings?**

The EPBD requires Member States to implement pathways towards nZEB levels by the end of 2018/2020. Member States are free to set their own performance standards. This rule has worked well in many Member States, but failed to deliver real ambition in others.

Following the philosophy of the trias energetica and the Energy Efficiency First principle, the nZEB definition first of all requires a minimisation of energy demand. This principle must be maintained in the EPBD revision.

The UK government planned to introduce a system which was based on net zero carbon. The system allowed buildings that were clearly not zero carbon (or energy for that matter), and definitely not having a residual requirement for "nearly zero or very low amount of energy". The significant residual carbon could be offset by investment in carbon saving projects off site. This would have yielded many buildings that would have used energy and emitted carbon for years to

come. Moreover, the government recently scrapped this goal and the UK is unlikely to build nZEB by 2021.

### **9. Will the 'nearly zero energy buildings' targets be met? Why/Why not?**

The targets are likely to be met in Member States which introduced a clear vision and forward-looking regulatory framework early in time in order to enable the construction sector to adapt in a step-wise approach. France has approved a long-term vision going even beyond 2020.

Other countries did not have this policy vision and the construction sector has therefore not developed competitive nZEB solutions.

The UK has just withdrawn the 2016 zero carbon goal for new buildings leaving industry in a regulatory vacuum.

The revised EPBD should not only include a final target for 2030 or 2050 but also require Member States to set and communicate binding interim targets. This should be closely coordinated with the national building renovation strategies as defined in article 4 of the EED.

### **10. How successful has the inclusion of Energy Performance Certificates in the EPBD been? Have the certificates contributed to improvements in energy performance of buildings?**

The introduction of the EPC should be seen as a major step forward although its goals have not been fully achieved yet. They empower building users / owners to make informed choices on the way they consume energy.

EPDs will have an increasing impact on construction markets in the long-term. First studies indicate that a good energy rating does have an impact on building prices, although other aspects remain dominant (offer vs. demand, location, price). As a matter of fact, a recent study<sup>1</sup> has shown that a one-letter improvement could lead to an increase from 2% up to 10% in the price of the property.

However, EPCs have a credibility problem in many parts of Europe. In some countries, one can order EPCs on a website or by phone by providing certain basic building-related information. This practice must be brought to an end. Inspectors need to be better trained and should not have any commercial interest in promoting a specific technology.

#### Other options to improve EPCs:

- Transform EPCs into "Building Renovation Passports" covering the building over its entire lifecycle, as in France or Germany (*Sanierungsfahrplan* in Baden-Württemberg), therefore empowering the owner and / or the tenant with a strategic renovation plan. They should clearly specify a building's long-term energy savings potential, explain the steps to be taken, and record improvement works already implemented.
- Mandatory and publicly available national databases of EPCs;
- Ensure that detailed tailor-made requirements are included and taken-up, notably by introducing a mandatory calendar of works for suggested cost-effective measures for public and commercial buildings;
- Strengthen the uptake of EPCs by real estate and property managers (raising awareness about the EPC benefits, notably in terms of property value);
- Improve the link between EPC and access to finance (e.g. linking the EPC to an interest rate);
- Promote the development of on-site inspection controls, and the creation of adequate sanction mechanisms (EPBD art. 27).

### **11. What has worked well in the EPBD? What needs to be improved?**

Many provisions are clear in the EPBD but improperly implemented at national level. As a matter of example, the nZEB definition clearly refers to minimising energy demand, but the UK implemented this as zero carbon with use of offsetting offsite. This should not be allowed.

#### Provisions that have worked well:

- Requirement to set and review MEPR at least every five years (art. 4);
- Requirement to set MEPR at cost-optimal level for building elements (art. 4);
- Development of energy performance requirements for new buildings towards nZEBs (art. 9).

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<sup>1</sup> Bio Intelligence Service, Ronan Lyons and IEEP, *Energy performance certificates in buildings and their impact on transaction prices and rents in selected EU countries*, 19 April 2013.

#### Provisions in need of clarification / strengthening:

- Reducing the +/- 15% margin when defining cost-optimal levels;
- Extending nZEB level requirements for existing buildings being renovated;
- Strengthening renovation requirements (specific target on - staged - deep renovations, introduction of the "consequential renovation" requirement);
- All requirements related to the EPCs (quality improvement, implementation of recommendations, quality of inspections, competence of certifiers);
- Improvement of national building renovation strategies (art. 4, EED).

#### **12. Is the EPBD helping to contribute to the goals of EU climate and energy policy (Reduce greenhouse gas emissions by at least 40%; increasing the share of renewable energy to at least 27%; increasing energy efficiency by at least 27%; reform of the EU emission trading system)?**

Buildings account for 40% of the EU's energy use and 36% of CO<sub>2</sub> emissions. Any reduction in the energy consumption therefore contributes to the EU's climate and energy goals (see study quoted under question 2). Over the last ten years, there has been a decoupling between economic growth and energy consumption in the EU. According to Eurostat, between 2006 and 2013, whilst the GDP has continued to increase or has remained stable, the primary energy consumption at EU level has decreased from 1 725 Mtoe to 1 575 Mtoe, i.e. -9%. This can be partly attributed to the EPBD. According to the ODYSSEE-MURE project, energy consumption of buildings has decreased by 0.9% annually since 2008, while the GDP has decreased by 0.3% annually in the same time.

Example: The heating demand of Europe's buildings is still covered to a very large extent by fossil fuels. Minimising the heating demand reduces CO<sub>2</sub> emissions and increases the energy efficiency of that building. If the overall growth in energy consumption can be slowed down / reversed, it becomes easier for renewables to achieve the envisaged 27% share.

It is however clear that the EPBD could deliver more, if its provisions on existing buildings were strengthened. A sectoral target, as part of an overall energy efficiency target, would trigger regulatory changes required to realise the full cost-effective savings potential.

#### **13. Is it in line with subsidiarity? What should continue to be tackled at EU level and what could be achieved better at national level?**

Yes. Art. 194(1) subpar. (c) (TFEU) offers the EU to possibility to take action on energy efficiency. Furthermore, the EPBD only defines goals and concepts but leaves full freedom to Member States as to the ways and means to achieve these goals.

Buildings form an integral part of the energy infrastructure. Hence, they will have a key role to play in the future Energy Union in terms of energy consumer, energy generator, energy storage facility and demand response medium. An overall European framework is therefore indispensable.

#### **14. Are the objectives of the EPBD delivered efficiently?**

Given the complexity of national and regional building regulations and the structure of the construction value chain, the delivery of the objectives was more difficult than initially thought. Efficiency and effectiveness could have been much higher if Member States had started transposition in time and set up a clear long-term regulatory framework. This lack of political will is highlighted by the numerous EU Pilots between the Commission and the Member States on the EPBD implementation. The delivery of objectives has improved over the years within the limits described in other answers of our response.

#### **15. Has the EPBD created any unnecessary administrative burdens? If so, please provide examples**

The adaptation to the EPBD provisions required a certain administrative effort. However, when transposed intelligently, the EPBD does not create unnecessary administrative burdens.

#### **16. Has the EPBD created any unnecessary regulatory burdens? If so, please provide examples**

The adaptation of building regulations at all levels to the EPBD provisions required a significant regulatory effort. However, if transposed intelligently, the EPBD does not create unnecessary administrative burdens.

## B. Facilitating enforcement and compliance

### 17. Is compliance with the provisions of the EPBD adequate?

In most Member States and for a number of provisions, compliance is inadequate. For example, 26 EU Pilots have been sent for non-notification of cost-optimal reports, and eight EU Pilots were sent for non-notification of nZEB reports. In May 2015, the European Commission sent a Letter of Formal Notice to France for partial wrong transposition of some EPBD requirements. In June 2015, there were two reasoned opinions. Austria and the UK have been asked to notify more information to the Commission before referral to the Court of Justice.

Much more work needs to be done to ensure full implementation at all levels.

See for example <http://www.buildup.eu/news/44581?CommunityId=2575>

Many countries did not see the EPBD as a tool to realise the multiple benefits of energy efficiency investments, but rather as a burden. Hence, there may be a difference between mere legal compliance and the clear political will to establish a coherent set of rules based on a long-term vision and covering building requirements, qualification needs and monitoring tools.

### 18. Is the definition of NZEBs in the EPBD sufficiently clear?

The diversity of national nZEB definitions is a clear sign that the European definition needs to be more precise. This is also highlighted by the fact that only 15 Member States have a final nZEB definition in place (April 2015), while 13 others still need to refine their existing definition.

The new definition should leave flexibility to Member States but ensure similar ambition levels across the EU taking into account national / climatic peculiarities. It must respect the trias energetica putting the primary focus on minimising energy demand. This is a prerequisite to the successful integration of buildings in energy systems.

As much of the uncertainty seems to be linked to the parts referring to RES, the new definition might just state that nZEBs should minimise energy demand and have a close-to-zero demand for energy imported from the grid. This would strongly stimulate RES use.

### 19. Is the NZEB target in the EPBD sufficiently clear to be met?

Whilst the targets themselves are unambiguous, the pathway toward nZEBs (art. 9.1) is not sufficiently clear and many Member States failed to establish a long-term stepwise tightening of requirements. This would have enabled the market players to prepare themselves. More stringent interim targets should have been established.

### 20. If not, what, in your view, are the missing factors that would ensure compliance with:

#### a. Minimum energy performance requirements in new buildings?

The directive should possibly be more explicit on the definition of nearly zero energy. For example, it could set a limit like the 15kWh/m<sup>2</sup>/year that is set for *Passivhaus*. The current EPBD allows too much wriggle room to regulators (see the UK example).

More on-site inspections and sanctions in the case of non-compliance should be encouraged.

#### b. Minimum energy performance in major renovations of existing buildings?

Missing factors to ensure compliance with MEPR in existing buildings are on-site inspections to verify compliance and quality, accompanied by severe sanctions in case of non-compliance.

#### c. Minimum energy performance for the replacing/retrofitting parts of the building envelope (roof, wall, window, etc.) and replacing/upgrading/installing technical building systems (heating, hot water, cooling, etc.)?

Missing factors to ensure compliance with MEPR are on-site inspections to verify compliance and quality, accompanied by severe sanctions in case of non-compliance.

#### d. Minimum renewable energy requirements to meet the NZEB target by 2020?

The nZEB definition, asking for nearly zero energy demand, should be maintained, as should the requirement to start considerations by maximising energy efficiency. A target for what this

means (like *Passivhaus* requirements for maximum demand for heating or primary energy) should be considered by the EU. The balance should be supplied by renewables such that the building supplies as much energy to the grid as it takes from the grid over the full year. That way, a flexible approach is maintained minimising energy demand and optimising RES use. Given the diversity of building design solutions, climatic conditions and access levels to RES, a minimum RES requirement would be sensible.

Clearly, in most regions, nZEB level cannot be achieved without using renewables.

**e. Certification of the energy performance of buildings, including tailor-made recommendations for the improvement of the energy performance of buildings?**

The missing factors include:

- A requirement for on-site visits of inspectors (no EPC via websites or phone);
- A limited validity of certification of inspectors and auditors;
- Minimum requirements for education level, including training and working experience, for inspectors and auditors;
- The obligation to implement the recommendations included on EPCs within a defined timescale for commercial and public buildings.

**f. Regular inspections of heating and air-conditioning systems?**

Random on-site inspections to verify compliance and quality should be introduced, accompanied by severe sanctions in case of non-compliance.

**21. Do you think the cost-optimum methodology gives sufficient evidence regarding the actual cost of renovating buildings on top of the additional cost for Near Zero-Energy Buildings?**

The cost-optimal methodology has offered significant progress towards achieving this goal. It has contributed to tightening minimum energy performance requirements mainly in less ambitious Member States.

With a view to improving the methodology; the EU should work towards harmonised PEF, introduce lower discount rates and reduce the margin (e.g. from +/-15% to +/-5%). Comparisons between Member States should become possible. Finally, the cost-optimum methodology should adopt a lifetime approach, taking into account future economic benefits of energy savings, the development of energy costs and maintenance costs.

See BPIE presentation

[http://www.wsed.at/fileadmin/redakteure/WSED/2014/PPTs/09\\_Atanasiu.pdf](http://www.wsed.at/fileadmin/redakteure/WSED/2014/PPTs/09_Atanasiu.pdf)

A new vision for cost-optimality

The cost-optimality method already allows for the inclusion of societal aspects. In the future it could be calculated based on our 2050 goals. If, by that time, we want our building stock (not each building) to achieve a nearly zero energy demand level, we can determine the cost-optimal pathway to achieve this. While such long-term projections are difficult, they could provide a clear vision to policy makers and the entire building sector and allow for more precise energy demand projections.

**22. No answer**

**23. What do you think of the various ways of calculating building energy performance at national/regional level? Please include examples.**

Definitions for nZEB, minimum performance requirements based on cost-optimality and other parameters such as the definition of a building's useful surface area are all described differently across countries and regions. Comparisons and benchmarking are therefore impossible. While this situation is not acceptable, harmonisation would be costly at this stage.

**24. What measures are missing that could simplify the implementation of building regulations to make sure that buildings meet the required high energy performance levels?**

Several measures can be proposed:

- A more harmonised approach towards the definition of nZEBs based on the above comments;
- National EPC databases enabling decision makers to assess progress;
- Turn EPCs into building passports to keep verifiable records of progress towards nearly zero energy demand for individual buildings;
- Set procedures to obtain more data on quality of the works;
- Promote the setting of quality requirements and sanctions in the national legislation;
- Set clear procedures and responsible actors to decide in case of non-compliance;
- Promote the introduction of (targeted) on-site inspections in national transposition law;
- Create one-stop shops to raise awareness and knowledge.

**C. Energy Performance Certificates (EPCs) and stimulating energy efficient renovation of the building stock.**

**25. Are the available data on the national/regional building stock sufficient to give a clear picture of the energy performance of the EU's building stock, as well as the market uptake of energy efficiency technologies and the improvement of the energy performance of buildings in the EU?**

Generally, available data are still largely insufficient especially regarding renovation and the uptake of deep renovation.

Centrally managed and publically available national registers for building passports (extended EPC) could help to fill this data gap and show progress over time. This, in turn, would enable Member States to assess the effectiveness of national regulations and take corrective measures, if required.

**26. Are the long-term national renovation strategies adopted sufficient to stimulate the renovation of national building stock? What examples of best practice could be promoted across the EU and how?**

These strategies, as foreseen by EED art. 4, could be an excellent tool to stimulate building renovation at national level. However, most national renovation strategies do not provide an ambitious, yet realistic long-term strategy coupled with a clear will for political implementation. Such a long-term vision can provide the stable and reliable regulatory framework required to stimulate investment in research, production and training.

Most of these strategies (except for Denmark) were not developed in an inclusive process, thus lacking sufficient buy-in from a number of building stakeholders that should implement them at national / regional level.

In addition, art. 4 (EED) includes interesting ideas, but only refers to the development and not the binding implementation of such strategies.

Although some difficulties lie in the hands of the Member States because of a lack of political will, the wording of art. 4 (EED) could also be improved and the requirements strengthened as follows:

- Mandatory consultation process with stakeholders in each Member State;
- Strategies to start from the 2050 targets and develop a more coherent planning with intermediate steps and milestones;
- Reporting to become a true reporting and monitoring of effective implementation of the national strategies, and not just a "tick-the-box" exercise of their design;
- Ensure coherence with EED art. 5 (3% yearly renovation rate for central government buildings), with EPBD Article 9.3 (national plans on nZEBs), and with the upcoming Building Observatory.

**27. Have EPCs played a role in increasing the rate of renovation, the extent of renovation, or both? For instance, are EPC recommendations being defined as the most effective packages of measures to move the performance of buildings and/or their envelopes to higher energy classes?**

EPCs have significantly increased the awareness of building owners / users / investors regarding building efficiency. However, as outlined above, there is no evidence that shows a positive impact of EPCs on renovation rates and depth.

The EPC recommendations are not detailed / clear enough to trigger targeted renovation activities (except perhaps DK or PT).

With a view to enhancing the role of EPCs in triggering renovation works, their quality should be improved and they should be transformed into building passports (see above). Such passports should become dynamic products including the following information:

- cover the building over its entire life cycle, as in France or Germany (Baden-Württemberg);
- provide clear and detailed recommendations for improvements with a view to realising its full savings potential (meeting the 2050 targets) which is equivalent to the concept of deep renovation;
- list improvements already implemented towards realising the full potential (corresponding to staged deep renovation);
- provide the basis for legal requirements ensuring cost-effective measures are taken up within a certain period of time for public and commercial buildings.

### **28. Is setting a minimum renovation target for Member States to undertake (e.g. each year; percentage of building stock) important and requires further attention in the context of meeting the goals of the EPBD?**

If we have the ambition to reduce the energy demand of our building stock by 80% by 2050, we must increase the renovation rate from 1% today to about 3% every year while ensuring that renovation is used to realise full savings potentials (depth of renovation). Focusing on a rate only will lead to letting a potential untapped, because the level at which Member States will renovate is unlikely to be compatible with the long-term 2050 ambition for the building stock (buildings being renovated in e.g. 2025 are unlikely to be renovated again before 2050).

Several options are possible. We could extend the minimum renovation rate included in art. 5 of the EED (i.e. 3% each year) to all public buildings, using the definition contained in EPBD Article 12, i.e. buildings occupied by a public authority and frequently visited by the public or even all buildings. The problem is that this approach does not ensure the full realisation of a building's savings potential (deep renovation) or a planned and coherent step towards its full realisation (staged deep renovation). This may result in lock-in effects. The current European legislative framework (3% renovation rate, "major renovation") only requires compliance with minimum efficiency requirements and, hence, will not prevent lock-in effects. This needs to change.

Another option is a target for each Member State to reduce the energy demand per m<sup>2</sup> and year by a certain percentage every year (for example 4%). This leaves more flexibility to Member States but does also not prevent lock-in effects.

However the target is designed, it must include requirements that trigger (staged) deep renovation.

### **29. Are obligations or binding targets for renovation or any other mandatory measure (e.g. mandatory minimum thermal efficiency standards for rental properties) missing from the EPBD to ensure that the directive meets its goals? If, yes, what kind of obligations and targets?**

Ditto 28. Yes, this is probably the best way to move forward, but the integration of mandatory measures needs to be placed in a context of national renovation roadmaps. Triggering (staged) deep renovation must be the key target.

Some Member States have developed interesting solutions that are designed to trigger renovation work. The Flemish and UK schemes may however lead to significant lock-in effects:

- Belgium (Flanders): A building can only be rented out if certain conditions are met (double glazing, roof insulation, condensing boiler);
- France: All private residential buildings consuming more than 330 kWh per m<sup>2</sup> and year, must be renovated by 2025. From 2030 onwards, all private residential buildings put out for sale, must have been renovated beforehand. All renovation works must get as close as possible to the requirements for new buildings.
- UK: Landlords can only rent out dwellings obtaining an energy performance rating better than F and G.

The above examples do not necessarily lead to (staged) deep renovation. The revised EPBD should propose that MS set binding targets for the (staged) deep renovation of the worst performing buildings, but leave it to national regulators to develop detailed measures.

### **30. Are EPCs designed in a way that makes it easy to compare and harmonise them across EU Member States?**

There is no European EPC design, but simply a description of its minimum content. Countries / regions have developed very different models in terms of content / details and lay-out. Energy performance classes are not comparable. Harmonisation / comparisons are therefore extremely difficult.

EPBD art. 11(9) calls for the development of a voluntary common EU certification scheme for the energy performance of non-residential buildings. This should have been in force by 2011, but is still not developed.

### **31. Do you think that the 'staged deep renovation' concept is clear enough in the EPBD?**

The concept of "staged deep renovation" is not well defined in the EPBD. A clear and binding definition is desirable. For the moment, only a Staff Working Document mentions "deep renovations" as renovations bringing 60% or more energy improvements.

We propose the following definitions:

Deep renovation should mean the realisation of a building's full long-term energy savings potential with a view to meeting the 2050 target of achieving nearly zero energy demand for the EU building stock.

Staged deep renovation could refer to coherent and planned steps undertaken towards this full savings potential. This information should be recorded in and provided to building owners / users with the Building Passports (based on EPCs). Such a dynamic and individual approach would make the concept of (staged) deep renovation understandable for everybody.

### **32. Have EPCs raised awareness among building owners and tenants of cost-efficient ways of improving the energy performance of the buildings and, as a consequence, help to increase renovation rates across the EU?**

So far, only to a small extent. EPCs are rather seen as a snapshot of the building's current energy performance. In most Member States, EPCs do not provide sufficient details on a building's efficiency potential and cost-effective measures to realise it, although this is a requirement of the directive.

We are not aware of studies assessing the amount of renovation works triggered by EPCs.

### **33. Should EPCs have been made mandatory for all buildings (a roofed construction having walls, for which energy is used to condition the indoor climate), independent of whether they are rented out or sold or not?**

Yes. Firstly, it would provide all building owners with useful information on the current energy demand / energy performance class and cost-effective savings potential (see above). Whenever building / transformation works are undertaken (e.g. aesthetic changes, equipment changes, accessibility improvements), the EPC should be used to combine this with energy efficiency measures, thus increasing their cost-effectiveness.

Secondly, Member States would gain a more accurate picture of the energy performance level of the building stock and of progress achieved.

## **D. Smart Finance for Smart Buildings: Financing energy efficiency and renewable energy in buildings and creation of markets**

### **34. What are the main reasons for the insufficient take-up of the financing available for energy efficiency in buildings?**

The reasons include the following:

- Too high interest rates (see the UK Green Deal). For this type of finance to work, interest rates need to be at about 2% over maybe 10-25 years.
- No earmarking of public funds towards energy efficiency in buildings (e.g. in the EFSI);
- Too many administrative burdens to get public financing;
- A lack of trust from the investors, because of regulatory instability (stop-and-go effects);
- Inappropriate Eurostat rules on public debt and deficit, limiting an off balance sheet treatment to energy efficiency investments;

- Too small contracts because of the lack of aggregators, when there could be an interesting potential in social housing for example.

### **35. What non-financing barriers are there that hinder investments, and how can they be overcome?**

Refurbishing people's homes can cause inconvenience, disruption and mess. There is an issue with awareness of the benefits of doing the work and, in some types of constructions, worries about the risks of technical problems with the work, e.g. condensation, mould, rot etc. Energy is too cheap for the financial benefit to drive people to overcome these barriers.

### **36. What are the best financing tools the EU could offer to help citizens and Member States facilitate deep renovations?**

There is no one-size-fits-all solution for the whole of Europe. Generally, positive feed-back was received with regards to the following tools:

- Tax exemptions, also from regional and local taxes, if a certain energy performance class is achieved;
- VAT reduction for renovation goods;
- Low interest rates (about 2%) linked with deep renovation projects and / or nZEBs;
- Risk-sharing facilities;
- First-loss guarantee funds;
- On-bill financing.

### **37. What role do current national subsidies for fossil fuels have in supporting energy efficient buildings?**

It is probably difficult to establish a straight link. However, the tax payers' money used for such subsidies can probably be used more effectively (in terms of GDP growth, job creation, climate policy, public budgets and health care costs) when incentivising building efficiency measures, which would reduce the demand for fossil fuels.

Subsidies granted to fuel poor people could be considered as indirect subsidies to fossil fuels. In the long-term, it will often be more effective to reduce the energy demand of buildings housing fuel-poor consumers, instead of perpetuating allocations.

**38.** No answer.

### **39. How is investment in high-performing buildings stimulated and what is being undertaken to gradually phase out the worst performing buildings? Is it sufficient?**

Investments in high-performance buildings:

Interest rates for credits should be linked to the amount of energy savings to be achieved (such as offered by the KfW). Furthermore, property taxes / local taxes should include discounts for highly efficient buildings (see French energy transition law and new Spanish measures stimulating deep renovation).

Phase-out of worst performers:

UK landlords will only be able to rent out flats if they meet at least the energy performance class E. The downside of this measure is that landlords tend to opt for shallow renovation to meet that class. This leads to substantial lock-in effects.

The French energy transition law introduces a requirement that houses / dwellings can only be sold if they meet certain performance requirements. The practical effects of this measure cannot be assessed at this stage, as the measure will be phased in over the next years.

### **40. What is being undertaken to solve the problem of 'split incentives' (between the owner and the tenant) that hampers deep renovations? Is it sufficient?**

Positive examples exist. In Germany, the landlord can recover a part of the investment cost through increased rents. The UK and Flanders set mandatory minimum standards for rental properties (UK scheme applicable from 2016).

More generally, the JRC<sup>2</sup> found that 65% of EU buildings still face split incentives, even though art. 19 (EED) addresses this phenomenon. Possible solutions include the following:

- Minimum standard for rental properties, which can apply to the whole sector, i.e. residential and commercial, public and private, and which can be made easier if tied with specific financing support schemes for owners (e.g. UK, Flanders in Belgium);
- Revision in rent acts to introduce flexibility allowing voluntary agreements between landlord and tenant or in multi-owner buildings, making it easier to redistribute benefits – Green Leases (e.g. France Energy Transition Law art. 14, Emilia Romagna in Italy, Netherlands);
- Specific financing schemes for multi-owners buildings (e.g. Netherlands, Bulgaria, Latvia);
- Increase transparency in energy use and costs.

**41.** No answer.

## **E. Energy poverty and affordability of housing**

### **42. What measures have been taken in the housing sector to address energy poverty?**

There are no EU level measures to address this issue, but several measures have been adopted in the housing sector at national level. The UK government introduced grant schemes “Warm Front Scheme”, mostly funded by a levy on energy bills, to target energy efficiency work on fuel poor homes. Ireland is running a similar scheme called the “Better Energy Warmer Homes Scheme”. Apart from these few positive examples, most of these programmes consisted in income support (Belgium, UK etc.) or energy price support, thus perpetuating high energy use.

### **43. Should have further measures tackling energy poverty been included in the EPBD?**

In 2012, 11% of the total European population was unable to keep their home adequately warm, increasing to 24% when referring to low-income people. The number of people victims of fuel poverty has been increasing since 2009. Therefore, more needs to be done. The following should be considered:

- Develop an EU-wide definition enabling policy makers to quantify and compare the scope of the problem in all Member States;
- Improving data collection on energy poverty in order to draft better regulations;
- Member States to include the issue in their national building renovation strategy (EED art. 4);
- Consider an EU-wide target to eradicate fuel poverty by 2040.

### **44. Has tackling energy poverty been a requirement when constructing new buildings and renovating existing buildings in Member States?**

Not per se, as far we know.

Some of the above-mentioned schemes (i.e. UK) could be mentioned here. Also the requirement that all new social housing in Brussels had to meet the Passivhaus standard well ahead of the nZEB target is an interesting element.

### **45. Are energy costs for heating and air conditioning being made available to interested buyers/tenants?**

Energy costs for heating and air-conditioning are partially made available to interested buyers / tenants through the EPC. However, the level of detail depends on the country. More details are made available in Denmark.

Data will always include an error margin, as energy costs will also depend on the number of building users and their user behaviour. Energy demand, as calculation in many other EPCs is based on theoretical calculations and not actual consumption.

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<sup>2</sup> Joint Research Centre: Overcoming the split incentive barrier in the building sector, 2014

## **F. Ensuring new highly efficient buildings using a higher share of renewable energy**

### **46. What are the best policies at district and city level to increase energy efficiency in buildings? Have specific targets on renewable energies in buildings been included?**

At all levels, the forerunner role of public authorities should be strengthened combined with awareness raising campaigns.

Art. 6.3 (EED) "encourage[s] public bodies, including at regional and local levels [...] to follow the exemplary role of their central governments". Regions and municipalities could use the national renovation strategies art. 4 (EED) and adjust them to their level.

Exemptions from local taxes can help to boost the building renovation rate, as it helps private owners to take action.

### **47. On the basis of existing experience, are provisions on targets or specific requirements for new buildings, beyond the current NZEB targets, missing in the EPBD which could help achieve the energy efficiency 2030 target? If so, in what types of targets or requirements?**

The targets for nZEB provide an ambitious, yet flexible vision and additional targets are not needed for new buildings. They revised EPBD should set clear targets for the renovation of the existing building stock.

### **48. Which building sectors have been addressed as a priority (public/private, residential/non-residential, industry, heating & cooling)?**

All buildings must be equally considered in the EPBD, whether public or private, residential or non-residential. Also industrial buildings (plants) should be covered.

The future EPBD should focus more on existing buildings and, first of all, encourage the deep renovation of the worst performers, since they have the greatest potential for improvement.

It should be noted that heating & cooling is not a sector in itself, but rather a type of energy use, whether in buildings or in industry, which can be considered as sectors. The energy efficiency of industrial processes should not be subject of the EPBD, as it is already addressed in the EED art. 8.

### **49. Has having no EU set targets (indicative or binding) for the sustainable public procurement of NZEB buildings by public authorities affected the development of NZEBs?**

In the current EPBD, the only requirement related to nZEB and public buildings is included in art. 9, i.e. new public buildings should be nZEB from 2019 onwards, and existing buildings are encouraged to be renovated towards nZEB level. This has had a positive impact, since professional property owners are fully aware that the building portfolio of public authorities will need to change and be upgraded.

Overall, however, the lack of a clear requirement hampers the wider uptake of nZEBs before the 2019 target date as specified in the EPBD art.9. EED art. 6 should require public authorities to procure only nZEBs in the case of new build.

EU Green Public Procurement requirements for office buildings are being developed, but the process has been very lengthy and sometimes contradictory. To the best of our knowledge, the latest draft requires new office buildings to achieve only energy performance class C which would be clearly unacceptable. A better coordination between Commission services is required.

50. No answer.

### **51. Does the EPBD address the issue of embedded energy? If so, in what way?**

The current EPBD does not address this issue and should not do so in the future, as this is already addressed by other European initiatives (CEN/TC350's EN15804 and EN15978 standards mandated by the Commission, GPP, Ecodesign, PEF, new building assessment tool of DG ENV etc.). The Commission will adopt a revised mandate M/350 to CEN with a view to aligning PEF and EN15804. The EPBD should keep its clear focus on energy efficiency and avoid duplication.

**52. Is demand response being stimulated at the individual building level and if so, how?**

It is not directly stimulated in the current EPBD. Given the fact that buildings are an important part of the energy system, the revised directive should call for measures enabling buildings to be integrated into energy systems and contribute to demand response. The EPBD's system boundary (building) should however be maintained with a view to avoiding duplication and legal confusion.

**53. What obligations are missing at EU level and national level, and at regional and local level to meet the goals of the EPBD?**

See above. The EPBD should provide far more detailed provisions regarding building renovation.

## **G. Links between the EPBD and district and city levels, smart cities, and heating and cooling networks**

**54. What are the best policies at district and city level for increasing energy efficiency and use of renewable energy in buildings?**

There is a strong ambition among municipalities across Europe to decrease their environmental footprint and, as part of this, to increase the energy efficiency of their building stock. Renovation programmes at district level have proven to be more cost-effective (economies of scale) and to have a significant awareness raising effect at the local level.

Furthermore, EED article 6(3), which "encourage[s] public bodies, including at regional and local levels [...] to follow the exemplary role of their central governments" should be implemented with true ambition.

55. No answer.

56. No answer.

57. No answer.

**58. Has the promotion of smart cities, smart buildings, sustainable transport solutions, smart mobility, and similar initiatives been linked with the EPBD and its aims? If so, how?**

Buildings form an integral part of the energy system and will have a key role to play in the generation, consumption and storage of energy as well as in demand response. In order to optimise these functions, buildings must primarily be designed in a way that minimises their own energy consumption. Secondly, interfaces need to be created to enable their full integration in smart environments.

Example: buildings with low power consumption but power generation capacities can be used as recharging stations for e cars.

**59. Have obligations been set at a national/regional level in relation to buildings and district heating and cooling, or in relation to buildings and storage? Why/Why not?**

Setting obligations at national or regional level in relation to buildings and district heating & cooling, or in relation to buildings and storage, if to be implemented, should be part of a coherent, long-term strategic national or regional plan, taking into account the decreasing energy demand stemming from buildings, as we should be aiming at an nZEB-level building stock by 2050.

As district heating & cooling includes industrial processes, the EPBD is not the right place to address this.

**60. What incentives are missing, that would help promote efficient district heating and cooling or meeting the goals of the EPBD?**

When planning efficient district heating networks, the long-term implications of reducing the heating / cooling demand of buildings through (staged) deep renovation needs to be taken into account. Otherwise, over-dimensioned generation capacities and supply networks might be put in place and become a stumbling block to ambitious renovation projects.

As district heating & cooling also includes industrial processes (which are outside the EPBD scope) all related questions should be addressed in the EED. The EED should require that the decreasing demand stemming from the building stock should be included in the long-term planning of heating & cooling networks.

**61. Have cost-optimal policies been devised that improve the performance of buildings so that they use less heating and cooling, while ensuring a decarbonised energy supply?**

The results are encouraging in many Member States. Building regulations based on the cost-optimality procedure usually reduce the admissible energy or heating energy demand of buildings. Hence they contribute to reducing heating and cooling demand. Statistics show (see question 2) that the efficiency of household space heating, measured in kWh or GJ/m<sup>2</sup>, has improved steadily since 2000, by around 2.3%/year at EU level. Logically, this reduces supply-related carbon emissions.

Furthermore, a several Member States are requiring the installation of renewable energy generation equipment on buildings, which further reduces CO<sub>2</sub> emissions from energy supply.

**62. Does the EPBD and its definition of NZEB reflect the requirements that could derive from the energy systems of nearly zero-emissions districts and cities?**

Yes, it does. Minimising a building's energy demand and covering the remaining demand by renewable energy sources (nearby) to the largest extent possible clearly contributes to the creation of zero-emissions districts and cities.

## H. Awareness, information and building data

63. No answer.

64. No answer.

**65. What relevant building data has been collected at EU and Member State level, and city and district level? Who has access to this data?**

Most countries do not systematically collect data. According to an ongoing study carried out by ICF International for the Commission in seven Member States, there is more information on new buildings than on existing buildings. As the focus of the revised EPBD should move to the renovation of the building stock, more information should be gathered on this topic. Access to data is generally limited. National, publicly available databases on EPCs should be set up to increase transparency and monitor progress.

**66. How can data on the energy performance of a building and its related renovation work, across its life cycle, best be managed and made available?**

The EPC should be further developed to become a building passport which clearly specifies a building's energy savings potential and records improvement works already implemented. The following options should be considered:

- EPC must be extended to include efficiency improvement measures already implemented as part of staged deep renovation activities;  
The core data (energy rating, improvement works already undertaken) should be made available in a publicly accessible database (Example Scotland: (<https://www.scottishepcregister.org.uk/>);
- Extend the need to hold an EPC to all buildings.
- Conduct random controls to check the accuracy of data.

**67. Has building data harmonisation been achieved?**

It has not been achieved at European level.

**68. Is there a need for a central EU database of EPCs and qualified experts?**

Given the fact that EPCs and nZEB requirements are not harmonised across the EU, a central database would not allow for valid comparisons. Hence, more harmonisation work would be

required before envisaging such a step. As EPC data bases should be accessible to local people (tenants, potential purchasers etc.) it needs to be available in the local language. Hence, an EU data base might be difficult to achieve. However, an EU register for commercial buildings may be sensible, as markets are more internationalised and design solutions vary less across the EU. The BPIE has already done substantial work on the assessment of the EU building stock. In the medium-term, the EU building observatory might collect all data from national data bases to integrate them into European data sets.

## **I. Sustainability, competitiveness and skills in the construction sector**

### **69. How does the construction sector cost-effectively demonstrate and check compliance with the EPBD while also upgrading the skill and knowledge of tradespeople and professionals?**

To the best of our knowledge, too little is done to demonstrate compliance with the EPBD. Training and qualification is mostly organised by public structures and / or joint structures with trade unions. Enabling tradespeople to build and transform existing buildings into nZEB is a task of paramount importance. The same applies to inspectors of technical building systems and energy auditors. Still, many Member States do not have mandatory training requirements in place.

### **70. Would it have been useful to extend Eurocodes to include energy performance in buildings and other relevant aspects? If so, why?**

No, the Eurocodes cover the building structure (structural strength). Building energy performance has a far wider scope.

### **71. Are energy, materials, waste and water use addressed in the EPBD?**

Obviously, the current EPBD addresses energy (efficiency). Materials and waste are not covered and should not be covered in the future, as this is already addressed by other European initiatives (CEN/TC350's EN15804 and EN15978 standards mandated by the Commission, GPP, Ecodesign, PEF, new building assessment tool of DG ENV etc.). The Commission is in the process of issuing a new mandate to CEN to align the TC350 standards with the PEF method. The EPBD should keep its clear focus on energy efficiency and avoid duplication.

As regards water use, a building water efficiency directive had been in discussion some time ago but was never officially proposed. The reasons for this should be examined before taking any initiative in the EPBD.

## **J. Building systems requirements**

### **72. Based on existing experience, do you think the setting of minimum requirements in the EPBD for technical building systems is missing? Would have technical building systems minimum requirements contributed to the improvement of buildings' energy performances?**

Minimum requirements for technical building systems are not required. The EPBD sets an overall target (nZEB), but leaves Member States / designers the choice of measures to achieve that goal (building envelope, technical building systems, renewable energy generation etc.). This approach should not be changed.

73. No answer.

### **74. Based on existing experience, do you think in the EPBD requirements is missing for regular inspections of the technical building systems to ensure:**

#### **a. that systems' performance is maintained during their lifetime?**

System performance should be covered by the warranty provided by the technical contractor.

**b. that owners/occupiers are properly informed about the potential improvements to the efficiency of their systems?**

The improvement potentials should be specified in the extended EPC (building passport).

**c. that replacement/upgrading of the technical building systems is triggered?**

The extended EPC should be used to suggest cost-effective improvement measures of the building (envelope, technical building systems etc.). Specific provisions for technical building systems are not required.

75. No answer.

**76. Are the requirements for building elements set by Member States optimised to avoid market barriers limiting the installation of building products complying with EU requirements/standards e.g., under eco-design requirements?**

Requirements for building elements are usually not set at EU level (unless windows are considered an element). Elements are composed of numerous individual construction products the free movement of which is governed by the Construction Products Regulation. The functioning of this piece of Internal Market legislation is currently being assessed. Hence, generally, there should be no market barriers.

There are only few EU requirements, mainly ecodesign requirements for energy-using construction products (e.g. lighting). An energy label for windows is close to finalisation and should harmonise certain product claims across Europe.

## **K. Operational management and maintenance**

**77. Based on existing experience, does the EPBD promote the key ways to ensure that buildings meet stringent efficiency targets in their operation?**

From a purely technical point of view, it does. However, in most Member States, minimum energy performance requirements are based on as-designed energy values, and not in-use (actual) energy values. A control is therefore difficult as installation quality and user behaviour cannot be addressed.

The revised EPBD should therefore encourage the provision of guidance to building users (how to use the building efficiently). Comparisons of as-designed demand and actual consumption would be useful.

**78. Based on existing experience, does the EPBD promote the best way to close the gap between designed and actual energy performance of buildings?**

The current EPBD does not include clear measures to avoid a performance gap. Such a gap can be caused by poor workmanship, faulty product specification and inadequate building design. None of those aspects is directly influenced by the EPBD. Apart from these building-related reasons, higher actual energy consumption might also be caused by poor user behaviour.

Building-related issues might be reduced by conducting a blower door test to check air-tightness and a co-heating test to check the performance of the building envelope. This would however increase overall costs.

79. No answer.

**Abbreviations used in its Reply are the following:**

Art.: article

CEN: European Committee on Standardisation

EED: Energy Efficiency Directive

EPBD: Energy Performance of Buildings Directive

EPC: Energy Performance Certificate

nZEB: Nearly-Zero Energy Building

PEF: Primary Energy Factor

RES: Renewable Energy Sources

TFEU: Treaty on the Functioning of the European Union