

Public Consultation on the Evaluation of the Energy Performance of Buildings Directive

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PUBLIC CONSULTATION ON THE EVALUATION OF THE ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE

INFORMATION ABOUT YOU

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European Council for an Energy Efficient Economy (ecee)

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Primarily EU, but in certain respects global

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A. Overall Assessment

Currently, about 35% of the EU's buildings are above 50 years old. Buildings are responsible for 40% of energy consumption and 36% of CO₂ emissions in the EU, and consume, on average, about 25 litres of heating oil per square metre per year. Some buildings even require up to 60 litres.

The Energy Performance of Buildings Directive (EPBD) aims to:

1. improve the energy performance of buildings in the EU, taking into account outdoor climatic and local conditions, as well as indoor environment requirements and cost-effectiveness.
2. require Member States to set energy performance standards for buildings,
3. require Member States to issue buildings with energy performance certificates, and
4. require Member States to ensure that, by the end of 2020, all new buildings are 'nearly zero energy' buildings

It sets out concrete ways of achieving the great untapped potential for energy savings in buildings and reducing the large differences in results that exist in energy saving outcomes between Member States.

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

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The EPBD has been successful in improving energy efficiency, especially in new buildings, a result documented in numerous studies e.g. from CA EPBD (Country reports), as well as in research conducted by BPIE, Ecofys, etc. It has resulted in a market transformation which eceee considers to be positive for the EU and its citizens, economically as well as socially and environmentally.

The EPBD has succeeded in creating a much stronger focus on the potential for improving the energy performance of buildings and has promoted tools and concepts (e.g. a common methodology to calculate the energy performance of buildings, common CEN standards, EPCs, nZEBs, cost-optimality) to drive forward improvements in the energy performance of the building stock. When evaluating the impact it is important to take into account the fact that the implementation of the directive has coincided with a difficult economic downturn in almost all MSs. This has led to delays in implementation, and in some cases, less ambitious implementation. The improvement in national regulations as a result of requirements set out in the EPBD has been a strong driver in many Member States for new innovation in the construction sector, which traditionally evolves slowly.

The EPBD has had less impact on existing buildings, especially the transformation of existing buildings to become nZEB. This has not yet begun to take place on a large scale. The low renovation rate - around 1% - has also contributed to this.

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

2500 character(s) maximum

Yes, it has been particularly helpful to have had clarity about the level of future energy requirements in building regulations in Member States. This has driven innovation as well as the learning curve in the construction sector, which in turn has helped to improve the energy efficiency of buildings as well as bring down costs.

Despite the slow uptake of nZEB renovation projects, the nZEB solutions and standards developed for new buildings will be an important driver and benchmark to increase the ambition level for future renovations.

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

2500 character(s) maximum

This has not been the intention of the EPBD. This will require additional financial, fiscal and other incentives, and strengthening of the rather weak Art. 4 in the EED, which concerns renovation roadmaps and long-term strategies.

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?

2500 character(s) maximum

The legislative framework in the existing EPBD is quite complete with a good number of tools and measures (nZEB definition, EPC, etc.) guiding the performance of the building itself, supplemented with the EED which operates at a more macro and strategic level of policy, covering broader targets and obligations which are aiming at driving the rate of renovation.

From the eceee perspective, the scope for improvement of the EPBD lies mainly in the area of better implementation. There remains a significant 'performance gap' between the potential of the legislation on paper and the reality on the ground in many MS. For example, nZEBs are poorly understood and in practice in many MSs, not genuinely "nearly zero energy", compliance control is weak and often almost non-existent, EPCs are often inaccurate and of poor quality; there is a lack of quality control and of accreditation for installers.

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

2500 character(s) maximum

For new buildings, the EPBD is indeed contributing to cost-effective improvement of the energy performance. Despite the slow implementation of nZEB in many MS, it still sets an important benchmark for new buildings.

For existing buildings that need to be renovated, the EPBD does specify the need to introduce min energy performance requirements at building as well as component level and is thereby contributing to the overall improvement in the energy performance of the building stock if the legislation is implemented as intended. Also, focusing on the performance gap between new nZEB and existing buildings will help to drive the demand for improved energy performance in the case of renovation.

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?

2500 character(s) maximum

The aim of ensuring the same level of ambition across the EU in setting MEPR has not been met, as there is still a wide disparity of requirements between MSs, for both new and existing buildings. There seems to be a general lack of acceptance within MSs regarding the importance to set ambitious energy performance requirements for buildings as part of a long-term energy and climate plan in order to profit from all related benefits.

A lack of political prioritization and implementation might also explain that the level of ambition when setting MEPR was not the same across the EU. In MSs with a tradition for having long-term climate and energy plans agreed with broad political support, the level of MEPR is generally highest. The continued improvement of the Cost-Optimal Regulation and its methodology will most probably help to raise the level of ambition most in MSs with less ambitious MEPRs.

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

2500 character(s) maximum

Like the nZEB definition being the benchmark for new buildings, having defined a reference target for the quality of the building envelope in existing buildings e.g. in terms of kWh/m² per year for the final energy demand for heating and cooling would be an efficient policy instrument to drive innovation and efficiently help to reduce the energy demand in the existing building stock long term (for example 2050, with milestones between now and then. An ambitious benchmark would as well be a useful reference for linking to national renovation programmes, the use of EU funding, ex ante conditionality, and for ensuring a good and healthy indoor climate.

There are a number of related issues which need to be carefully addressed and not compromised when improving the energy performance of existing buildings, such as ventilation, noise reduction and fire safety. Especially, fire safety is an area of growing concern as we are experiencing a reduction in time for a fire to develop as the building envelope becomes tighter and can contain high amounts of combustible materials if this is not regulated.

Reduction of energy losses from technical installations such as hot pipes and cooling distribution systems are also areas which are not regulated based on energy performance today.

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

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The EPBD has resulted in the setting of energy performance standards, although the effectiveness of these is difficult to judge. The influence of the Directive has varied across Member States, depending on the existing level of requirements in their building codes. For example, in countries such as Estonia, the Flemish region of Belgium and Lithuania), the cost-optimality requirement led to an increase in the required standard, whilst in others (e.g. the UK) the existing requirements were considered sufficient and hence no improvement was needed. However, in Member States where existing actions are considered sufficient, the importance of the EPBD as a 'backstop' should not be forgotten. The example of NZEB policy in the UK is a good illustration here: the national trajectory to ZNEB has recently been abandoned, but the Government will now have to explain how it intends to meet the requirements of the Directive, which should therefore result in a new trajectory being defined. This might not have been the case in the absence of the EPBD.

We should bear in mind that defining the absolute level of energy performance requirements for new buildings is a competence of the MS. Some EPBD provisions such as Article 5 (cost-optimality) and Article 9 (nZEBs) have been instrumental in driving changes and in many MS; cost-optimality, together with Articles 3 and 4 of the EPBD have led to improved performance standards for new buildings.

Despite many MS having introduced a national definition of nZEB, more clarity and guidance on nZEB definitions and conditions are needed from EU level, while still allowing flexibility on the side of MSs.

Increasing the level of ambition in the nZEB definition is still needed.

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

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It does not seem likely that the nearly zero energy buildings targets will be met. Recent work by the Buildings Performance Institute Europe (Factsheet: Nearly Zero Energy Buildings Definitions Across Europe) found that, as of April 2015, nine Member States had yet to finalise a definition of nZEB and, in those that had, the values defined for maximum primary energy consumption varied by a factor of four to five. In addition, only eight countries have established nZEB requirements for existing buildings. The main problem here is the ambition gap between MSs' nZEB definition and the EPBD nZEB ambition being really "nearly zero energy". Some MSs will most likely reach their nZEB target but their target will not be ambitious enough in relation to the cost-effective potential or the cost-optimal level, using existing technology.

Experience from e.g. Denmark and Germany has proven that the learning curve improves fast when MS introduce a clear pathway for adoption and introduction of nZEB level requirements. Therefore, it is very important to adopt a nZEB target, but it is equally important to develop a roadmap to implement it, especially to give investors and market players the regulatory predictability and stability needed to drive and stimulate innovation and improvements.

More clarity and guidance on nZEB definitions and conditions, enforcement of national legislation, on-site inspection and certification schemes for the workforce are areas which need further development.

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

2500 character(s) maximum

The inclusion of provisions related to the EPC in the EPBD is a positive development, although the full impact and usefulness of EPCs has not yet been reached. EPCs are an effective tool to give information to owners and tenants about the energy performance of their building and to highlight where improvements can be made and in which order they should be made. If based on quality energy audits (or so-called investment grade audits), EPCs can also provide prospective investors with important information on cash flow, life cycle costs and pay back periods.

The level of the EPCs are starting to have an impact on the asset value of properties and including the EPC rating in the advertisement when buildings are for sale has been successful in increasing awareness about the importance of buildings' energy performance.

The deployment of EPCs should therefore be further developed in the future with the aim to develop the EPCs to become an investment grade audit. Therefore increased focus needs to be placed on improving the quality and reliability of EPCs as this remains a challenge in all MS.

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

2500 character(s) maximum

Key provisions which have had a positive impact on the market:

- The requirement to set and review MEPR at least every five years, and revise them if necessary;
- The requirement to set MEPR at cost-optimal levels for building elements;
- The development of energy performance requirements for new buildings towards nZEBs. Despite a slow implementation thus far in national building regulations, this has set a clear benchmark for the construction sector to drive innovation and has already been instrumental in increasing the demand from professional investors, and some regions and cities for the nZEB standard.

Areas for improvements:

Today, 75% to 90% of the existing building stock is still inefficient.

Next to strengthening the minimum level of energy performance for existing buildings and individual components when being renovated – special attention should be paid to “trigger points” for introducing mandatory requirements to upgrade energy performance if below a certain performance threshold e.g. when a building is rented out or sold. This type of legislation is now being introduced in e.g. DE, F and the UK.

Having a high quality EPC will facilitate this type of measure.

Increased attention to national implementation and enforcement of national laws, notably by promoting on-site controls, is an area which still needs improvement. Construction of nZEB and very low energy buildings does require special attention from not only the manufacturers and designers but also from the installers and construction workers. A legal framework of certification for the construction workforce could help to ensure a minimum level of quality and competence.

Increased measures to facilitate the transformation of existing buildings into nZEB need urgently to be developed and supported by EU initiatives. National finance mechanisms providing long-term access to soft loans and default guarantees must be established, making maximum use of EU funds and national revenues, inter alia from auctioning of ETS allowances – building on the principle of revolving funds. Increased use of ex ante conditionality for access to EU funds must be further developed.

Further improvements and strengthening of requirements related to the EPCs (quality improvement, implementation of recommendations, quality of inspections and competence of certifiers) should be addressed. Removal of barriers (split incentives, pricing structure and accounting rules; off-balance sheet investments).

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)?

2500 character(s) maximum

As buildings use 40% of the EU final energy consumption, and account for 36% of the GHG emissions, reduction of the energy demand in buildings must continue to be a key priority for the EU. With the nZEB requirements for new buildings from 2018/2020 in the existing EPBD, the benchmark for new buildings has been established. Therefore, energy performance requirements for the existing buildings and drivers for building renovation must become the key focus in order to ensure that the full cost-effective saving potential is reached for each building while not compromising on indoor climate and safety for the users. So, the answer is a resounding “yes”, the EPBD is helping very much to reach EU climate and energy goals, and the EPBD can do even more if it is strengthened and supported by financial and fiscal incentives and by other pieces of legislation, such as EED, RED, and ESD.

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?

2500 character(s) maximum

According to Article 194(1) in the TFEU, subparagraph (c), it is clear that energy efficiency is an EU competence and should continue to be so. As buildings counts for 40% of the EUs final energy consumption, energy performance of buildings must remain a policy area driven by European legislation with a high level of ambition and a future-looking perspective creating a stable, progressive and predictable legislative framework which is highly needed to drive sufficient innovation and investments, aiming at a significant sustained reduction of the energy demand in the building sector.

However, some flexibility for the Member States to adapt to national or regional conditions and circumstances will be needed when implementing EU legislation (e.g. setting more detailed requirements), but the thorough implementation has to be ensured and verified in close cooperation with the Commission. In that sense, the EPBD is fully in line with subsidiarity. A valid argument that has been used to defend EU-level initiatives in the buildings performance area against complaints of lack of subsidiarity is the fact that while some MS have developed ambitious policies and measures, including ambitious building codes, not all MS have done so. The EPBD has been quite important in improving the energy performance of buildings in especially the new MS.

14. Are the objectives of the EPBD delivered efficiently?

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The objectives of the EPBD are only partly delivered. The EPBD does specify concrete actions with a view to achieving the great unrealised potential for energy savings in buildings and reducing the large differences between Member States' results in this sector, recital (7). However, the implementation has been too slow and with too little ambition in many MSs. In some areas more guidance from the Commission may be needed (in regard to nZEB and financial instruments, to stimulate the transformation of existing buildings towards nZEB) but it also has to be taken into account that the implementation has taken place during the economic crisis in the EU and MS have not fully recognised the building sector as a solution to improve the economic situation of the Union. Also, as mentioned earlier, tools like the EPC and the quality of certifiers need to be improved considerably in many MSs to reap the full benefits of the EPBD.

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

2500 character(s) maximum

The EPBD has tried to minimise administrative burdens, seen from the perspective of member organisations in government energy agencies. Reporting requirements are proportional and appropriate. Even requirements to report on nZEB and cost-optimality seem reasonable and proportionate, especially considering the huge cost-effective savings potential that is at stake.

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

2500 character(s) maximum

No. The information we have received from government, and from industry and other end-use sectors is that the regulations that the EPBD results in, such as building codes, their review, and their revision are among the most cost-effective tools available for realising the savings potential that is available to MSs.

B. Facilitating enforcement and compliance

Compliance is recognised as being of critical importance in achieving the full energy efficiency and carbon savings potential of buildings. Strong local and regional verification of compliance with national building codes is required in order to reassure consumers of the quality of buildings.

The 2010 recast EPBD introduced targets for Near Zero-Energy Buildings (NZEBS) and more ambitious minimum energy performance requirements for new buildings. The EPBD defines NZEBs as a building that has a very high energy performance as determined in accordance to Annex I of the directive. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby. The EPBD sets the target for Member States to ensure that by 31 December 2020, all new buildings are nearly zero-energy buildings, and after 31 December 2018, new buildings occupied and owned by public authorities are nearly zero-energy buildings.

The EPBD also considerably reinforced the provisions for existing buildings, broadening the scope to all existing buildings (removing the 1000 m² threshold). It set and applied minimum energy performance requirements for the renovation of parts of the building envelope (roof, walls, etc.) with a view to achieving cost-optimal levels. It also set and applied minimum energy performance requirements for technical building systems (large ventilation systems, air conditioning, heating, domestic hot water system or combination of these) whenever they are installed, replaced or upgraded. It applied minimum energy performance requirements to all types of building works. The EPBD introduced a benchmarking system (the 'cost-optimal methodology' which calculates the energy performance level which leads to the lowest cost during the estimates economic lifecycle) to improve the level of ambition of the energy efficiency requirements contained in national or regional building codes while ensuring that these obtain the best value for money and that they are regularly reviewed.

A key aspect to be examined as part of the EPBD evaluation is how proper enforcement of the energy efficiency requirements in regional and national building codes is ensured.

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

2500 character(s) maximum

Compliance with EPBD provisions could be much improved in general. For the nZEB definition only a few MSs follow precisely the definition and its intention as set out in the EPBD. A significant number have not yet agreed and reported on a definition. Full implementation and compliance with national regulations is a key element for success. According to a poll, 70% of German companies find the implementation of EU legislation an important driver in the energy efficiency field (Deutsche Unternehmensinitiative Energieeffizienz (DENEFF), Branchenmonitor Energieeffizienz 2014, May 2014.)

Better transposition, implementation, focus on enforcement and on-site control would increase the compliance rate. Compliance with the EPBD provisions is not only a matter of quantity (e.g. number of EPBD articles which are well transposed and properly implemented), but of quality in implementation.

A legal framework of certification for the construction workforce would also help to improve skills, to limit failures and build confidence in delivered performance.

Other ways of improving compliance are to set quality requirements in the national legislation and promote the introduction of on-site inspections. Improving the skills of the whole supply chain through training will lead to more trust and reduce failures during construction.

The 2nd Qualicheck Conference in September 2015 revealed numerous areas in buildings' energy performance in MSs where compliance was inadequate and could be improved by better national regulations and other secondary legislation. These included data quality, EPC certification compliance, asset ratings versus measured consumption, and more. But many can be improved considerably.

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

2500 character(s) maximum

The current definition of nZEB in the EPBD could be improved. Although Article 2(2) sets the main criteria, defining an nZEB as a “building that has a very high energy performance [...] The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewables sources produced on-site or nearby”, there are several concepts which remain very vague (i.e. “very significant extent” of RES and the “nearby” location of RES has caused many problems for the national implementation). This might explain why only 15 MSs have a final nZEB definition in place (April 2015), and 13 MSs still need to refine the existing definition.

This lack of clarity leaves the door open to different interpretations in different MSs and has indeed resulted in huge differences in the definition of an nZEB energy performance ranging from 0 to 270 kWh/m²/y, although most MSs define it at around 45 or 50 kWh/m²/y (for residential buildings).

To improve the nZEB definition, it would be necessary to redraft it by putting into practice the true “Energy Efficiency First” Principle, i.e. making sure an nZEB is first about maximizing energy efficiency, and then about inclusion of RES, as is set out in the concept of Trias Energetica. This first requires reducing energy demand as much as is economically justified. Thereafter, renewables are introduced to cover remaining energy demand. Finally, where further renewable use is not possible and fossil fuels must be used, this use must be made as effective as possible. Introducing a requirement at EU level for all MSs to set a maximum limit for heating and cooling demand per square meter would be an important step to reduce the huge gap in ambition level between the MSs. This could be based on a benchmark set at EU-level.

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

2500 character(s) maximum

For new buildings the nZEB target is clearer than it is for the transformation of the existing buildings stock towards an nZEB benchmark. The pathway for the transformation, without any kind of milestones for the existing building stock, is not sufficiently defined in the EPBD. It is left to the MS to “draw up national plans for increasing the number of nearly zero-energy buildings”. More guidance on measures and level of ambition (e.g. a 100% nZEB building stock by 2050 with intermediate targets) is needed. Also guidance on a benchmark level for heating and cooling demand in existing buildings when being renovated will be useful to drive innovation and to help plan and scale future supply systems.

Clear and long-term targets and trajectories are essential to enable market players to prepare themselves for upcoming changes in the requirements. Currently, the deadlines set at national level do not sufficiently give the right signals sufficiently long in advance to the market, although from a technological point of view, a much faster move towards nZEB is possible as there is currently no technology gap or lack of usable and effective, and cost-effective technologies. Huge benefits are to be achieved when upscaling.

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

a. Minimum energy performance requirements in new buildings?

2500 character(s) maximum

Increased use of on-site inspections to verify compliance with specifications and quality, including some third-party control, accompanied by severe sanctions in case of non-compliance. The model used in the Flanders region could be an example. A legal framework of certification for the construction workforce would improve skills and limit failures and thereby increase confidence in delivered performance. Improved data collection and harmonisation, more measured values, and greater use of databases for EPC results, would also help. Another key factor to help ensure compliance with requirements to meet the nZEB target is the need to raise awareness about wider benefits of achieving a building stock at nZEB level, especially in improved comfort and indoor climate.

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

2500 character(s) maximum

On-site inspections to verify compliance and quality, accompanied by severe sanctions in case of non-compliance. A legal framework of certification for the construction workforce would improve skills and limit failures. There is also a need to improve the functional definition of a major renovation. This would prevent a series of small renovations from being carried out instead of a major renovation, and could thereby facilitate onsite inspection and improve 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.)?

2500 character(s) maximum

On-site inspections to verify compliance and quality, accompanied by severe sanctions in case of non-compliance. A legal framework of certification for the construction workforce would improve skills and limit failures. Since there are also requirements for individual element replacements to meet the building codes, compliance is more difficult to ensure, and more expensive. However, improved skills of the workforce, and codes of conduct could help here. Also the use of both certified workforce and certified enterprises would help.

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

2500 character(s) maximum

From available analysis it seems useful to establish a useful and complete definition of NZEB might include all of the following elements:

1. A LIMIT SHOULD BE ESTABLISHED to energy needs for heating, cooling and hot water and for lighting. Energy needs for heating, cooling and hot water and for lighting (and optionally energy use for ventilation, auxiliaries and plug loads) are based only on physical variables and the choice of thermal and visual comfort set points and hence do not require weighting factors (as opposed to primary energy, which need relatively arbitrary assumptions - e.g. primary energy value of nuclear, of RES sent to the grid..)

2. THE INTERACTION WITH THE ENERGY NETWORKS (electricity, District heating,...) of on-site generation from PV, wind or other RES should be quantified by means of e.g. a "load matching index" or other similar indices. Large mismatches might imply large consumption of fossil fuel resources in some parts of the year and impose costs on the grid (energy storage, line upgrades). A way to reduce the absolute value of the mismatch is to reduce the energy needs. Reducing energy needs for heating and cooling also implies long time constants of the building (it takes more time to cool down in winter or warm up in summer), allowing to shift demand in time to better match generation. With smart meters and smart grid metering of generated and exported energy in little time steps and calculation of the load match index, only small investments are needed.

3. ONE OR MORE LONG-TERM COMFORT INDICES calculated according to EN 15251 or other relevant literature, because "an energy declaration without a comfort declaration makes no sense" as stated in EN 15251. IEA Annex 52 "Towards Net Zero Energy Solar Buildings" has analysed and proposed methodologies for incorporating comfort indexes in the characterisation of zero energy buildings. In any case, energy-related benchmarks for nearly zero buildings must include the underlying comfort level explicitly and quantified.

4. A WEIGHTED PRIMARY ENERGY BALANCE defined as in EN15603:2008 calculated on monthly or shorter time intervals. Transparency of the calculation methodology and how primary energy factors are derived is fundamental.

Moreover, the measures in Article 9(3c) for the promotion of nZEBs should ensure the rollout of nZEBs. Quality energy audits will show when it is cost-effective to start investing in RES such as photovoltaic, after heating and cooling demand is met.

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

2500 character(s) maximum

Missing factors to ensure compliance with EPC requirements are for example:

- Increased quality and perceived value of the EPCs, when asset values are improved by higher performance;
- Minimum requirements for education level, including training and working experience, for inspectors and auditors;
- An obligation to implement recommendations included in EPCs within a defined timescale - as part of a renovation roadmap towards nZEB level designed for the individual building;
- A lack of awareness at the level of building owners, tenants and prospective investors of the multiple benefits of building renovation.

f. Regular inspections of heating and air conditioning systems?

2500 character(s) maximum

Missing factors to ensure compliance with regular inspections of heating and air-conditioning systems are on-site inspection to verify compliance and quality, accompanied by severe sanctions in case of non-compliance. Also beneficial would be the increased use of measured or metered values, as well as greater use of energy performance contracts for maintenance - especially for larger commercial, public and multi-family buildings.

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?

2500 character(s) maximum

The cost-optimal methodology has proven to be useful to drive MEPR in MS where these requirements were less advanced. Depending on factors such as the discount rates used, nZEBs can exceed the current cost-optimum level and should continue to be allowed to do so as there are a number of factors in the C-O calculation which do not sufficiently represent the long-term benefits to the individual house owner from the future economic, environmental and social benefits of energy savings, such as health and indoor comfort, in addition to societal benefits.

22. Are there any cost-effective measures for ensuring compliance at local and regional level that could be replicated and used to improve compliance on a larger scale?

2500 character(s) maximum

In order to ensure compliance at local and regional level, some cost-effective measures could be introduced, such as on-site inspections focusing on quality and compliance, accompanied by severe sanctions in case of non-compliance. Also, as mentioned earlier, better data collection, measurement and verification and use of databases would help.

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

2500 character(s) maximum

Annex I of the EPBD, as well as the 31 different 1st generation EPBD CEN standards and "Umbrella Document" showing the system performance calculation methodologies and the building's system boundaries provide the MS with a framework to calculate the energy performance of buildings. The Cost-Optimal Regulation provides a coherent benchmark upon which to calculate and establish a level of ambition for each MS MEPR. However, as the data and measurements used in the calculations are not always the same, and the parameters, such as discount rates, can vary somewhat, between MS, it is almost impossible to compare the level of requirements between MS. A harmonisation of national calculation methodologies has started with the ongoing work on 2nd generation EPBD standards carried out by CEN, with a view to establish them as default values, but there is clearly a wish to continue to allow for national flexibility in the calculation approach.

However, moving to nZEBs it becomes increasingly important that systems and products deliver the expected performance when installed and during their full life time as the "safety margin" or "tolerance" between calculated performance and delivered performance becomes more sensitive and critical for proper performance when constructing nZEBs. This has been a key problem in DK when moving closer to the nZEB level for both new buildings and renovation (one of the problematic areas has been to ensure the correct level of airtightness. This has now been solved by stricter regulations requiring on-site testing when certain levels are used in the calculation. Another area of concern is the delivered performance compared to theoretical or design performance - e.g. in one of our own renovation projects of an office building where the energy consumption has been reduced with 84%, the electricity consumption shows during the monitoring phase to be 36 % higher than calculated with the BE10 (Danish calculation model). The main reason was shown to be that the efficiency (the COP factor) of the heat pumps had been too low (factor 2,79 against the theoretical factor 3,43). The biggest concern is therefore not the different calculation methods but if the components are performing as calculated in the final building. Also, when components are put together into a system, the performance of the whole system may not be the estimated sum of the performances of the components, due to installation differences.

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?

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On-site inspections during the construction phase (for building permits) and after completion of construction (permission to use the building) and measurement of performance of a statistically significant sample of the buildings for a period after the building has been put into use, including proper control of building application, and severe sanctions in case of non-compliance These currently are either missing or very weak.

A legal framework of certification for the construction workforce could improve skills and help to limit failures. For larger commercial buildings, public buildings and multi-family buildings standardised maintenance contracts are necessary to ensure proper performance.

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

Building energy efficiency has been increasing at 1.4% per year. This relatively low rate is owed largely to low renovation rates. To reap the benefits of energy efficiency and the use of renewables in buildings, the biggest challenge is to accelerate and finance upfront investments and speed up the renovation rate of the existing stock to above 2% annually. The aim of EPCs is to transform the building sector by setting ambitious energy efficiency standards and incentivise investment in renovating buildings to improve their energy efficiency, and facilitate a single market in and the free circulation of highly specialised workers, solutions and technologies and investments in energy efficiency and renewables in buildings. These aims have been identified as drivers for investment in renovation. In addition, the Energy Efficiency Directive (2012/27/EU, 'the EED') required Member States to establish, by April 2014, a long-term strategy for mobilising investment in the renovation of the national 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?

2500 character(s) maximum

The current available data on the national and regional building stocks is not sufficient to give a clear picture of the energy performance of the EU's building stock, or of the market uptake of energy efficiency technologies and the improvement of the energy performance of buildings in the EU. Data is not collected in a systematic way across Europe and especially data on renovation and the level of improvements in energy performance are information which is not collected in a systematic way. This has been shown in the MS submissions for Article 4 in the EED as well as Art. 5, both of which have been analysed in studies carried out by BPIE and ECF/Coalition for Energy Savings.

Having access to good data on the European building stock would help the European Commission as well as Member States to apply a more targeted approach when drafting legislation. E.g. when it comes to setting thresholds (e.g. floor area), and identifying building typologies to be tackled first, as well as data on the worst performing buildings. The lack of data is linked to the lack of rigor, quality control and transparency in the data collection, which should be more systematic and should allow for aggregation at local, regional, national and EU level. A centrally managed register for energy performance in buildings could help to give a clearer picture of the EU building stock, and would also help to monitor progress over time, therefore leading to better designed and applied policies. In this respect, BPIE initiatives ("Buildings under the Microscope" Report, Data Hub, Building Observatory) can be seen as one way to go. But these efforts need to be more evenly and strongly supported by the Commission and by all MSs.

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?

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The long-term national renovation strategies, as foreseen by EED Art. 4, are in theory a good tool to stimulate building renovation at national level. They are in principle recognised as a positive development by market players. However, in Germany for example, according to a poll, 80% of the companies involved in the energy efficiency market found that more could be done on the national energy efficiency strategy, and that more policy stability was needed. In Denmark a huge project was initiated inviting all relevant stakeholders to help with drafting and providing input to the strategy. Moreover, the existing building renovation strategies in Art. 4 of the EED will need not only clearer guidance from the Commission, e.g. by defining a clear objective of the strategy, such as having a nZEB building stock by 2050 and making use of mandatory reporting templates, and more carefully defined obligations on how to put the national strategies into practice, including the provision of the necessary financing, both public and private. MS did not in the first round of drafting their national renovation strategies seize the opportunity to adopt a clearly long-term strategy on how to upscale renovation of their building stock. Therefore, the forward-looking perspective needs to be enhanced, notably with the introduction of true “new measures”. The long-term national renovation strategies shall not serve as a recyclable paper for existing measures. Second, even if some strategies seem to be good-quality products, their implementation is lagging behind or is non-existent. Although some difficulties lie in the hands of the MS due to lack of political priority, the wording of EED Art. 4 could thus also be improved and the requirements strengthened and made more actionable. Improvements to EED Art. 4 would include:

- A mandatory consultation process with stakeholders in each MS;
- A reporting requirement which becomes a true reporting, monitoring and verification of implementation, and not just a “tick-the-box” exercise; -A better linkage with EED Art. 5 (mandatory 3% yearly renovation rate for central government buildings), and with EPBD Art. 9(3) - national plans on nZEBs;
- A more coherent and actionable planning, reporting, monitoring and sanctions approach. A clear obligation to put into practice the strategy that has been developed, including funding and financing instruments involving both public and private funds.

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?

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The inclusion of provisions related to the EPC in the EPBD is a positive development. Noteworthy is the request to include the energy performance indicator of the EPC in advertisements when a building is put up for sale has in several studies been shown to have had a positive impact on the market value of buildings having a high energy performance. Positive examples of well-designed EPCs and databases include Denmark, Ireland and Portugal. However, no direct link between EPCs and the rate or depth of renovation in Europe can currently be established. In most MS the recommendations are not well developed and lack information on costs and benefits based on real facts and figures. This is an area that really needs attention if EPCs are to be as useful as they were intended to be. A high quality energy audit - e.g. an investment grade audit - would be a good starting point. This can be linked to Art. 8 of the EED, and its Annex which also cover 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?

2500 character(s) maximum

Setting a minimum renovation target for MSs ensures sufficient political attention and commitment to achieve the target. However, both rate and depth of renovation shall be considered.

One possibility to widen the renovation target would be to extend the renovation rate included in EED Art. 5 to all public buildings and buildings receiving public funding, using the definition contained in EPBD Art. 12, i.e. buildings occupied by a public authority and frequently visited by the public, and not only buildings owned and occupied by central governments. . A renovation target could even be applied to all buildings, although this would most likely need to be accompanied by a framework of financial and fiscal incentives. Other measures to increase the renovation rate could be the mandatory “consequential renovation” requirements, or removal of the possibility to rent out inefficient buildings, as will be the case in the UK from 2018. Also, as in some Baltic countries, link access to public funds or tax rebates to actually carrying out the renovations in privately owned buildings. Ex-ante conditionality for MS access to EU funds should be increased. The depth of renovation must be ensured. For example, today, EED Art. 5, focusing only on the renovation rate, allows many possibilities for exemptions or alternatives. By setting a minimum renovation target, the Commission must ensure that the depth of renovation is ambitious enough, i.e. ensuring that renovations will target the nZEB level. Defining a benchmark level for renovations (in terms of a maximum energy demand for heating and cooling) similar to the nZEB level would be a relevant approach as this will also allow for proper staged renovations to be planned. One example is to set a long-term objective in the form of a benchmark or target similar to the Passivhaus. In which the building must be designed or renovated to have an annual energy demand below 15 kWh/m² year for heating and 15 kWh/m² year for cooling. A peak load factor can and in fact should be included, also be included. It’s also worth noting that the Passivhaus concept is based not only on low energy demand, but also on a maximum allowable power load (less than 10W/m²).

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?

2500 character(s) maximum

A clear obligation or binding target, or a legal framework containing a set of benchmarks that can evolve into a target, is a fundamental condition to ensure sufficient political priority on national drivers for renovations. While a pledge and reporting requirement is judged to be too soft or light-touch approach, mandatory reporting templates and a stringent review process by the Commission could still be part of a binding framework.

We are starting to see MSs themselves introducing different kinds of mandatory requirements for upgrading the energy performance in buildings. Such obligations could inter alia be a mandatory minimum EPC level for rental properties, whether commercial or residential buildings. In the UK for example, it will be forbidden to rent out properties with an EPC of level "F" or "G".

In France there is a clear strategy to first target the worst performing buildings and buildings that have an energy consumption above 330 kWh/m² year will have to bring the energy consumption down before 2030. In Germany, Denmark and Belgium there are examples of mandatory requirements to either upgrade energy performance of individual elements or to replace certain heating systems before a given timeframe. However, it is important to underline that mandatory measures needs to be parts of an overall renovation strategy with a clear and well defined long term objective.

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

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Currently, the EPCs are not designed at all in a way which allows for comparison and harmonisation across the EU. Indeed, EPCs are still designed at the national level, with little guidance at EU level. This is true of both the substance and the quality of EPCs. Therefore, there are very different EPCs in terms of content (since there are different calculation methodologies), design and quality. Some harmonisation, especially of quality of the EPC and of certifiers is urgently needed.

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

2500 character(s) maximum

Although elements of the policy framework needed for staged deep renovation are included in the EPBD (for example, within Articles 7 and 8) the concept itself is not elaborated in the Directive and neither Article 11 nor Article 4 of the EED requires the provision of the type of information that would be needed to encourage this type of action. A strong example of how recommendations for energy efficiency actions can be structured to support staged deep renovations is offered by Baden Wuerttemberg's methodology for a renovation roadmap (https://um.baden-wuerttemberg.de/fileadmin/redaktion/m-um/intern/Dateien/Dokumente/5_Energie/Beratung_und_Information/SanierungsfahrplanBW/Must er_Sanierungsfahrplan_BW.pdf)

The concept of deep renovation and therefore also the concept of "staged deep renovation" has not succeeded in being implemented in much national legislation. Therefore a nZEB benchmark level in the form of a maximum energy demand for heating and cooling, and possibly DHW and RES requirements or benchmarks would very likely be easier to understand and to implement as a renovation target. If necessary, nZEB can be linked to deep renovations, but ultimately the concept of nZEB should prevail.

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?

2500 character(s) maximum

EPCs, although being a good tool, have not yet delivered their full potential in helping to increase renovation rates across the EU MSs, partly because the recommendations in many, and probably most MS are inadequately described and presented, including their financial implications.

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?

2500 character(s) maximum

Before making the EPCs mandatory for all buildings, whether they are rented out, sold, or not, the first step shall be to ensure that this provision is effectively implemented on the ground and that the quality of the EPCs are at a sufficiently high level. Having a mandatory EPC for each building would improve the relevance and effectiveness of the national renovation roadmaps, and could potentially trigger more and better building renovations if the EPCs include a high quality renovation plan aiming at reaching a nZEB benchmark level. Instead of requesting EPC for all buildings at once it could be implemented in steps starting with the worst performing buildings or buildings constructed before a given year. It can also be linked to an incentive scheme or tax rebate, agreements with banks to provide better mortgages to high-performance buildings, and information campaigns connected to EPCs.

D. Financing energy efficiency and renewable energy in buildings and creation of markets

The EU has been supporting the improvement of the energy performance of buildings for many years with a range of financial support programmes. As almost 90% of building floor space in the EU is privately owned and more than 40% of residential buildings date from before 1960, most financing has to come from private sources. The Energy Efficiency Financial Institution Group (EEFIG), an expert group set up by the European Commission and United Nations Environment Programme Finance Initiative, published their final report in February 2015. The report identified the need to engage with multiple stakeholder groups and scale up the use of several financial instruments as part of a clear and enforced 'carrot and stick' legislative framework. The group also made a strong case for combining public funds with private sector investment to address risks and achieve the scale of financing needed.

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

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There are several reasons explaining why there is an insufficient take-up of the financing available for EE in buildings: -Difficulty on the part of investors and lending institutions to assess and understand the technical and financial risks, as well as the cash flows and life cycle analysis involved in investing in renovation projects. A clear need for better (investment grade) energy audits -No earmarking or ring-fencing of public funds towards EE in buildings (e.g. in the EFSI);

- Too many administrative burdens and transaction costs to get public financing, especially for smaller projects; a clear need for better aggregators;
- A lack of trust from the investors, because of regulatory instability and predictability, therefore there are stop-and-go investments;
- Too strict Eurostat rules on public debt and deficit, forbidding to give an off balance sheet treatment to EE investments, especially at regional and local level;
- Too many small contracts because of the lack of aggregators and intermediaries, when there could be an interesting potential in e.g. social housing.
- Although renovations of buildings has risen in the EIB list of priorities, it could be raised even higher;
- Better rules and regulations for energy performance contracting, promoting longer-term contracts to cover renovations and maintenance thereafter;

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

2500 character(s) maximum

E.g. the price structure for district heating where a fixed part of the energy bill is linked to the m² of the building - this barrier can easily be removed by linking the price only to the energy consumption. Also, if more of the so-called non-financial multiple benefits are quantified and included in the cost/benefit calculation, this would improve the life cycle cost analysis significantly, even from the perspective of the private building owner. This is also true from a societal perspective, if public funding is being used to leverage private financing. Another important non-financial barrier is lack of information on available technologies and their many benefits, including added comfort. Inertia and fear of change are also important barriers.

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

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Cohesion policy funding, and technical guidance relating to its deployment in this sector, are important. Deployment funding needs to be flexible enough to support staged deep renovation, while respecting ex ante conditionality of other EU legislation. Also, there should be greater emphasis in the guidance on including specification of performance at the building level, in addition to component level, where the latter is most important for small or partial renovation, and not deep renovation.

In order to help citizens and MS facilitate deep or nZEB renovations, the EU needs easily accessible, standardised, cheap and available financing on a long-term basis, as regulatory stability has been identified by investors as key. Removing current barriers to energy performance contracting and extending their length, while revising accounting rules to allow public sector off-balance sheet accounting of such debt, will be very useful.

National finance mechanisms providing long-term access to soft loans and default guarantees must be established, making maximum use of EU funds and national revenues, inter alia from auctioning of ETS allowances - the principle of revolving funds is useful, as is increased use of ex ante conditionality for access to EU funds. An optimal level of leveraging for the use of public funds to mobilise private investors needs to be established. Such financing tools could include:

- Tax exemptions, also from regional and local taxes;
- VAT reduction for renovation works, including private, non-social housing; (this may require changing the VAT Directive);
- Lower or graduated interest rates linked with deeper renovation projects and/or nZEBs (à la KfW);
- Risk-sharing facilities, such as those sometimes found in ESCO contracts such as EPCs;
- First-loss guarantee funds;
- On-bill financing (à la PACE in US);
- More Green Bonds, possibly based on an EU Carbon Counting methodology (like ASE in the US), that links renovations to carbon emission reductions, directly;
- Mandatory earmarking of more EU ETS auctioning revenues or building renovations;
- By linking EPBD financing requirements to building renovation in Articles 4 and 7 of the EED, as well as in the emissions reductions obligations for MSs in buildings as set out in the ESD -now under revision- especially if harmonised carbon counting methods or white certificates can be agreed.

The EU should also allow more funding of private projects, e.g., the residential renovation sector.

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

2500 character(s) maximum

Current national subsidies for fossil fuels have a negative role as they perpetuate the use of polluting fossil fuels, and do not help supporting energy efficient buildings. On the contrary, if national subsidies are granted to vulnerable consumers / fuel poor people, it will hamper building renovation, as it will appear as a short-term solution. Fossil fuel subsidies should be phased out rapidly and the subsidies used instead to ensure proper renovation programmes, as is now being implemented in e.g. Lithuania.

38. Have energy efficiency and renewable energy projects been combined to maximise their financing? How can the EU help?

2500 character(s) maximum

We need to remind ourselves that the proper use of the Cost-optimality methodology, with its life cycle cost analysis and proper discount rates, will provide considerable guidance for establishing the level of heating and cooling demand that is in line with the cost-optimal introduction of integrated renewables, including PV, as well as ground source heat pump investments.

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?

2500 character(s) maximum

A huge number of different national or regional subsidy schemes exist. However most of them do not have as a target high-performing buildings and often their funding is not sufficient, very complicated to apply for, or has a very limited life time. The existing approach in this area is therefore far from sufficient. In addition, subsidies and financing often lead to renovations that are not optimal, and that realise only a relatively small share of the total, and quite large savings potential. This locks in much of the potential. Both legislation, targets/benchmarks and guidelines at EU level are needed to correct this. As an example, a 50% improvement in the energy performance of a mixed stock of buildings of different ages in an average EU municipality is often considered by some to be ambitious. In reality, the cost-optimal performance improvement level is often closer to 70% or 80%, depending of course on the age of the stock.

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?

2500 character(s) maximum

The current policies targeting the issue of split incentives are not giving sufficient results. Solutions include for example to set mandatory minimum standards for rental properties, as will be the case in the UK from 2018. Also, as in the NL, in rent-controlled areas and social housing, allowing the landlords to raise the rent somewhat to recoup the investment cost, while sharing the energy savings with the tenants is being allowed.

41. Taking into account the experience and achievements to date, would

a) scaling-up of existing public funds alone be sufficient to meet the goals of the EPBD?

2500 character(s) maximum

No - it is still a challenge to develop a replicable model for evaluating small projects and for distributing EU funds to many small investments. The work done by EFFIG has been helpful, but most of the recommendations still need to be put into practice. Standardised solutions and instruments, e.g., should be given priority.

b) aggregation of energy efficiency investments in buildings (e.g. enabled by standardisation of Energy Performance Contracts and clarification of regulatory and accounting issues) contribute to the achievement of EPBD goals

2500 character(s) maximum

No. There was a lot of discussion but there is still a big need for some results. Some progress has been made in a few MS, but a much larger and more harmonised effort is still needed to remove these barriers, as set out in Art. 19 of the EED. Article 19, e.g., should be the object of infringement procedures in MS that still have not removed barriers to Energy Performance Contracting.

E. Energy poverty and affordability of housing

Energy poverty affects living conditions and health. It has many causes, including a combination of low income and general poverty conditions, energy-inefficient homes and a housing tenure system that fails to encourage energy efficiency. For example, in Britain, 9,300 people died prematurely due to the cold during the [winters of 2012 and 2013](#).

The Energy Union has identified a combination of measures, mainly in the social field and within the competence of authorities at national, regional and local levels, as the only effective way of tackling energy poverty. When phasing out regulated prices, Member States need to propose a mechanism to protect vulnerable consumers, which could preferably be provided through the general welfare system. If provided through the energy market, it could be implemented through schemes such as a solidarity tariff or in the form of a discount on energy bills. The UK Government is preparing a programme under which doctors will be able to prescribe boilers, insulation and double glazing to fuel-poor patients suffering from health conditions exacerbated by cold homes.

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

2500 character(s) maximum

Energy poverty is not a concept which is generally established at national level. At the EU level, no measure has been specifically adopted in the housing sector in order to address energy poverty. It also seems that very few comprehensive measures have been adopted in the housing sector at national level in order to really address this problem. There are only a few energy efficiency programmes which have been developed at national level to specifically address fuel poverty, mostly in the UK. Several MS allocated part of their social budget for income support which is also applied to support energy cost.

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

2500 character(s) maximum

Energy poverty is an important social problem but it does not fall within the scope of the EPBD. It is more of a strategic problem and as such could be better addressed in the EED.

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

2500 character(s) maximum

The focus is more on access to affordable but quality buildings in general in the social housing sector, and not directly linked to energy poverty. The use of high energy performance buildings as the most effective and cost-effective means available of combatting fuel poverty is a position that needs to be promoted much more strongly at EU, national, regional and local level.

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

2500 character(s) maximum

Energy costs for heating and air-conditioning are made available to interested buyers / tenants in numerous countries e.g. this is the case in Denmark and Sweden. For tenants, in many countries, the cost of heating is included in the rent and is not always made known to the tenant. The on-going debate on the cost-effectiveness of individual metering is a sign of this problem. If the building stock is broken down into different types of buildings, individual metering of heating, cooling and DHW will be shown to be cost-effective in many cases, according to numerous studies.

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

Directive 2009/28/EC on the promotion of the use of energy from renewable sources ('the RES Directive') requires Member States to introduce in their building regulations and codes appropriate measures to increase the share of all types of renewable energy in buildings. One possible measure is Demand Response, which is a set of time-dependent programme activities and tariffs that seek to reduce electricity usage and provide control systems that encourage load shedding or load shifting at times when the electricity grid is near capacity or electricity prices are high. Demand Response helps to manage building electricity costs and to improve the reliability of the electricity grid.

By December 2014, Member States must, in their building regulations and codes, require the use of minimum levels of energy from renewable sources in new buildings and in existing buildings that are subject to major renovation. These provisions are complementary to the Near Zero-Energy Building (NZEB) requirements in the EPBD, which set clear obligations to reduce the primary energy consumption of buildings and recommend that the resulting nearly-zero or very low amount of energy needed should be covered to a very significant extent by energy from renewable sources. The Roadmap to a Resource-Efficient Europe (COM (2011) 571) proposed that buildings should be renovated and constructed with greater resource efficiency. While the Energy Efficiency Directive ('the EED') and the EPBD have an impact on building and construction activities they are not designed to provide an overall life-cycle approach. For newly-built NZEBs, from a life cycle perspective, the share of embedded energy is almost as great as the share of energy consumed in the building's use phase.

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?

2500 character(s) maximum

Development of local and regional renovation plans based on the model of the national renovation roadmaps, according to EED Article 4, is a key element in policies to increase energy efficiency in buildings also at district and city level. The best policy is first to ensure that local authorities have an overview of the local building stock and its energy performance. EED Article 6(3) does already encourage public bodies, including at regional and local levels [...] to follow the exemplary role of their central governments”, the EPBD could therefore promote the adoption and implementation of regional and local renovation strategies. Article 14 in the EED requires MS to assess the possibilities for DH/C and CHP, with a special emphasis on renewable energy sources. The Renewables Directive (RED) is also clear on this point. MS are also required in Articles 6 and 7 of the EPBD to assess the possibilities for DH/C, CHP and RES in both new and existing buildings undergoing renovation. What is needed in all of these Articles is a clearer requirement to first optimise heating and cooling demand in the buildings before considering DH/C, heat pumps or on-site or nearby renewables. This ensures correct dimensioning of energy supply. If there is any question on the cost-effectiveness of doing this, it can be tested with cost-optimality calculations. A thorough monitoring of progress, coupled with a long-term vision, are key elements to ensure improvement at the district and city level in terms of energy efficiency of buildings. Another key element is if the city or region decides to act as first movers to set the example with their own buildings and to tell the positive story to the citizens. Flexibility and the advantages of decentralised energy supply need also to be taken into account.

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?

2500 character(s) maximum

The EPBD already requires all new buildings to be built to nZEB level by 2021. Rather, the emphasis needs be put on existing buildings, for which more specific requirements are highly needed. A requirement to have all existing buildings renovated to reach a nZEB level by 2050 is a good example of what is missing as a driver. For both new and existing buildings an EU nZEB benchmark level specifying the maximum energy demand for heating and cooling would be useful - jn fact necessary - to reduce the ambition gap between the different MS. Based on existing experience where it has been very expensive to identify and remove materials of "high concern" in buildings, it would be pertinent to develop a system (a "building passport") to keep track of construction materials used in a building including the availability for recycling at a later stage either when replaced as part of a renovation or if the building is being demolished. This will be an important step to introduce the circular economy in the construction sector.

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

2500 character(s) maximum

All buildings shall be considered in the EPBD, whether public or private, residential or non-residential. Without compromising the text in the EPBD on new buildings the priority sector for the EPBD should be existing buildings with regard to building renovation. In particular, the worst performing buildings shall be tackled first, since they have the greatest potential for improvement. Recently announced programmes (e.g. France) indicate that in some MS, social housing and the worst performing buildings are being addressed first. It is important to highlight that heating & cooling is not a sector in itself, but rather a carrier for different types of energy use, whether in buildings or in industry, which can be considered as sectors. Efficiency of the Heating and Cooling supply should therefore continue to be addressed in the EED, including in Article 14 of the EED.

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?

2500 character(s) maximum

In the current EPBD, the only requirement related to nZEB and public buildings is included in Article 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. The nZEB requirement for public buildings only applies for new buildings to be constructed at nZEB level from 2019, and the general encouragement for existing buildings to be renovated to nZEB level. Applying similar conditions, renovation to nZEB level before a given date, to existing buildings being rented out or bought by public authorities through public procurement would be a very important driver for the renovation market and for upscaling nZEB renovations. Currently, there is no specific target in EED Article 6 requiring public authorities to buy or to rent nZEBs only. The closest reference in Art. 6 requires central governments to purchase only “buildings with high energy-efficiency performance”. This should be changed to nZEB to be consistent with Art. 9 of the EPBD, when nZEB becomes the norm for public buildings in 2019. Defining a benchmark level for public and private sector renovations (in terms of a maximum energy demand for heating and cooling in kWh/m² per year) similar to the nZEB level would be a relevant approach for renovations to be planned. One example is to set a long-term objective in the form of a benchmark or target similar to the Passivhaus. In which the building must be designed or renovated to have an annual heating and cooling demand below 15 kWh/m² per year for heating and 15 kWh/m² per year for cooling. See e.g. http://passiv.de/downloads/03_certification_criteria_residential_en.pdf

50. Has the EPBD framework improved the self-consumption of electricity in buildings?

2500 character(s) maximum

No, only to the extent that in EPBD Articles 6 and 7, MS are required to assess the feasibility of alternative energy supply systems, such as integrated renewables including PV and solar thermal panels. These are also promoted in the EED and RED. MS subsidies for these renewables have, partly as an effect of the EPBD, been promoted at times quite heavily. There is a need to coordinate these subsidies better with the need first to reduce heating and cooling demand for the building in order to optimise the use of such renewables, and reduce their cost.

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

2500 character(s) maximum

The EPBD is not intended to address the issue of embedded energy, as it only regulates the designed energy consumption in the use phase. Consequently, if other elements are to be considered, there are a huge range of other factors which should be relevant to take into account as well to ensure sustainable buildings (CO2 footprint, resource use, fire safety, acoustic performance, waste, recyclability, water use etc...). In future, the EPBD could be transformed into a sustainability directive including embedded energy next to other indicators. But it seems to be too early now, as projects like the EC-project to define a framework of core indicators for resource-efficient buildings are still running and a new Circular Economy package is expected. However, as we are experiencing a huge development in the number of national and private schemes for characterising the sustainability performance of buildings, a harmonization of this area in a separate EU Directive, based on the existing TC350 standards for sustainable construction, would be a welcomed initiative.

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

2500 character(s) maximum

Demand Response is currently not being simulated at the individual building level, although in the on-going public consultation in preparation for a Communication on Energy Market Design, as set out in the Energy Union strategy, demand response will be given considerable attention, including how best to prepare the building sector as well as appliances and technical systems in buildings, for increased use of demand response.

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

2500 character(s) maximum

A more detailed and longer-term benchmark with milestones for nZEB, expressed in kWh/m² per year for the maximum energy demand for heating and cooling covering both new and existing buildings is needed. See responses to Q 28 and Q 49 for proposed levels of performance in future nZEBs.

On-site inspection, a legal framework and standard solutions for certification schemes covering companies & craftsmen, as well as a minimum quality threshold for the energy audit used in building energy performance certification; preferably equivalent to an investment grade energy audit should be required.

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

The EPBD focuses on reducing energy demand and increasing energy efficiency and the share of renewable energy consumption in buildings (mainly on-site or nearby).

Alongside this, reducing transport needs, promoting active mobility, public transport and e-mobility in cities are important policy levers for achieving long-term European policy objectives in the field of climate change, energy and transport. Targeted use of information and communications technology will enable smart solutions that bring together different physical infrastructures and operational technologies. This would facilitate a better quality of services at lower cost, enabling better maintenance planning, for example, and approaches to investment that are focused on real needs.

When examining energy efficiency and renewable energy supply, the considerations at district and city level are different from those at building level. Heating and cooling networks can play an important role in improving the energy performance of buildings, but are also dependent on advance planning and adequate implementation (both at city and district level). Solutions for local renewables, co-generation and storage have in many cases proven to be more cost-effective at district level than at the level of individual buildings.

The EPBD is an instrument that could be used to address the differences at district and city level, and help Member States to develop a comprehensive strategy

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

2500 character(s) maximum

The best policies at district and city level to increase energy efficiency in buildings is first to ensure that local authorities have an overview of the local building stock and its energy performance as already required in EPBD Articles 6 and 7 and in EED Articles 6(3), which “encourage[s] public bodies, including at regional and local levels [...] to follow the exemplary role of their central governments”. The EPBD could therefore promote the adoption and implementation of regional and local renovation strategies, based on the model of the national renovation roadmaps, according to EED Article 4. Broader assessments are required for MS in EED Article 14, where it is stated that “by 31 December 2015, Member States shall carry out and notify to the Commission a comprehensive assessment of the potential for the application of high-efficiency cogeneration and efficient district heating and cooling, However, this needs to be combined with a parallel assessment of the potential to reduce heating and cooling demand, before the potential study for DH/C supply is carried out. This might require an additional Article in the EED chapter on energy efficiency on the demand side. A thorough monitoring of progress, coupled with a long-term vision, are key elements to ensure an improvement at the district and city level in terms of energy efficiency and use of renewables energy in buildings.

55. Are there any separate (new) obligations set at city and district level missing from the EPBD which would help increase energy efficiency and use of renewable energy in buildings?

2500 character(s) maximum

The current system boundaries of the EPBD should not be changed and should not go beyond what the building owner can influence. The building should remain the primary scope of the EPBD. Already the “nearby” boundary has caused many problems in the national implementation. Therefore introducing a separate nZEB benchmark for the maximum energy demand for heating and cooling covering both new and existing buildings could help to simplify the boundary of the EPBD. A revision of the EPBD (and EED) would present an opportunity to provide MS with a clearer and more workable definition of nZEB, including a clearer system boundary for the building and its curtilage.

56. How has the information exchange on smart technologies which contribute to compliance of the EPBD, been promoted in cities?

2500 character(s) maximum

ecee has no view on this question.

57. Are smart meters and their functionalities contributing to meeting energy efficiency targets and the proper implementation of the EPBD? Are other targeted meters for heat, gas and water such as those for electric meters needed?

2500 character(s) maximum

Smart meters are already allowing more-time-of-use tariffs, cost-reflective night and off-peak tariffs. This will in principle reduce peak load generation costs and costs for reserve capacity for producers and can in principle benefit the consumer. But this is true only if the utilities do not claim the savings themselves by increasing their profit margins. Heat metering is more controversial, with many MS claiming it is not cost effective to install individual heat metering. It is also not clear how effective heat metering is to influence behaviour. It is necessary, however, to decide this from case to case and building complex to building complex. It is wrong to claim one size fits all, and that entire national building stocks would not be cost effective for installing heat metering.

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?

2500 character(s) maximum

Yes, in EPBD Articles 6 and 7 and in EED Articles 6 and 14, where assessments and plans are required. Smart cities, Covenant of Mayors and similar projects and programmes have increased the focus on the level of activity in the buildings renovation sector. However, it would be best to develop these further in the EED and not the EPBD, expanding EED Articles 4, 6, and 14, and perhaps adding a new Article in the EED, an Article 12 bis, in the energy use efficiency chapter, to require plans for reducing energy demand, especially heating and cooling demand, as a complement to an expanded Art.4 in EED. EED is more suitable for strategic and "macro"-level measures, while the EPBD is aimed for addressing building-level measures.

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?

2500 character(s) maximum

District heating and cooling is at best a “district” issue. If any kind of obligations at national or regional level in relation to buildings and district heating/cooling, or in relation to buildings and storage, are to be implemented, it 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 a nZEB-level building stock by 2050.

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

2500 character(s) maximum

Before planning new district heating networks, the first step should be to take into account the long-term implications of reduction of heating and cooling demand in buildings through renovation (i.e. achieving a nZEB-level building stock by 2050). The current system boundaries in the EPBD focusing on the energy performance of the building are correct, and should not be changed.

A typical building will change heating & cooling system several times during its lifetime making it essential to optimize the energy performance of the building envelope independently of its current heating and cooling system, reducing the energy demand as much as possible. As a consequence, heating and cooling supply shall not be regulated within the EPBD, apart from the links to efficient planning (i.e. adequately matching heating and cooling to a decreasing demand stemming from the renovation of the building stock while approaching the nZEB level), and the requirement to consider alternative and renewable energy supply systems, as set out in Articles 6 and 7 of the EPBD.

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?

2500 character(s) maximum

This should be the object of a Commission study. However, it is likely that the current use of the cost-optimal method, which includes assumptions on the carbon price and data on available technical solutions and their cost, would lead to exactly such policies and measures. This is partly because it is normally about half as costly to reduce energy demand as it is to produce energy, including heat.

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?

2500 character(s) maximum

Yes, the general concept of the nZEB definition comes close to working, although some additional guidance and some additional requirements on the envelope for heating and cooling demand will improve the nZEB definition to ensure that the cost-optimal level of heating and cooling demand is reached before on-site or nearby, or district alternatives of energy supply are calculated and considered. Setting a 2050 benchmark for the performance level of nZEB for the building stock should be considered a key part of this.

H. Awareness, information and building data

Public information and awareness play a key role in improving energy efficiency in privately-owned buildings. There is a need for clear and accessible information for citizens, professionals and authorities to enable them to evaluate the energy performance of buildings. If this information is provided in similar formats it would make it easier to compare energy performance and, in particular, help identify best practice solutions, as almost 90% of building floor space in the EU is privately owned (and over 40% of residential buildings were built before 1960). The following questions focus on your experience of the information provided and your suggestions for improving the information flow.

63. What do you think of the quantity and quality of information on the importance of energy efficiency provided to consumers by:

1. the European Commission?

2500 character(s) maximum

There is a great deal of information on energy efficiency coming from all levels, including the European Commission and its support programmes, such as Horizon 2020. Civil society has also been quite active. The quality is in general high. However, there is still a need to tailor-make the information to target different groups to increase the impact of the information. One example is the financial sector. EFFIG has tried to do this and will continue to do so in the forthcoming study by consultants to seek ways to implement some of the recommendations from EFFIG, including standardised solutions for contracts, financial instruments, energy audits, etc.

2. national authorities?

2500 character(s) maximum

eceee has no view on this question

3. regional authorities?

2500 character(s) maximum

eceee has no view on this question

4. local authorities?

2500 character(s) maximum

eceee has no view on this question

5. local companies?

2500 character(s) maximum

eceee has no view on this question

64. Has the directive promoted information on opportunities for consumer-friendly smart meters and interoperable energy efficient appliances?

2500 character(s) maximum

Article 8(2) of the EPBD requires MS to follow the requirements set out in the Internal Energy Market Directive for Electricity to promote smart meters and when appropriate smart appliances and technical installations in buildings. According to reports from MS, this is happening, in some MS on a large scale. The forthcoming Market Design Communication offers a new opportunity to promote this idea, and the concept of demand response, even further. It is, however, important that the consumer benefits from smart meters, and not just the energy producers and distributors. Regulations can ensure consumer protection in such cases.

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?

2500 character(s) maximum

BPIE has developed a database of considerable scope and quality on building statistics, covering MS, and achieving more detail than EUROSTAT or ENERDATA (ODYSSEE). Now, through the Observatory, BPIE will enhance this. Also, in the soon-to-be-launched follow-up consultant study to EFFIG, in addition to looking at standardisation of financial and contractual instruments, an EU level database of actual building financial instruments linked to technical data will be considered for feasibility and very likely action. This should also be developed and maintained at MS level.

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?

2500 character(s) maximum

This can be done with national and regional databases and linked to the individual property covered by the EPC or building passport. It could possibly even be linked to the building tax records and databases, or the local authorities responsible for building and renovation permits. Afterwards it can be aggregated at national level. And even possibly, in generic form, at EU level.

67. Has building data harmonisation been achieved?

2500 character(s) maximum

No, there is still a lot to do here. Some progress has been made with definitions in the new umbrella document (TR) by CEN TC 371 EP Project Group, through its mandate to develop 2nd Generation EPBD standards. But this work needs to be carefully overseen to avoid confusion if attempts are made to change building system boundaries.

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

2500 character(s) maximum

A central EU database will only have a very limited value as long as the EPCs are not comparable in terms of quality and content.

I. Sustainability, competitiveness and skills in the construction sector

The construction sector plays an important role in the European economy, generating almost 10% of GDP and providing 20 million jobs, mainly in micro- and small businesses. Designers, architects, builders, inspectors and certifiers, financiers, and national and regional supervisory authorities need to have the necessary skills and qualifications to ensure buildings are built effectively and using renewable energies. The sector is still largely craft-based, and there is huge scope for efficiency gains and more user-friendly retrofitting services as part of more industrial approaches, and through financial/planning/construction/maintenance package solutions based on strategic partnerships between SMEs and financing providers.

Through the EU's BUILD UP Skills initiative, between 2011 and 2013, energy efficiency skills needs and gaps for blue collar workers in the construction sector were identified in 30 countries (EU, Norway and the Former Yugoslav Republic of Macedonia). Each of these countries has produced a detailed status quo analysis with the participation of all main public and private stakeholders. From 2013 the BUILD UP Skills initiative has focused on the implementation of the national status quo analysis by setting up national training and qualification programmes for blue collar workers. These programmes have been put in place in 21 EU countries. With the launch of Horizon 2020, a new topic (EE4) on construction skills is now targeting training needs for both blue and white collar workers. Five projects focusing on skills in the construction sector will run until 2018.

The competitiveness of construction companies is an important issue, not only for growth and employment, but also to ensure the sustainability of the sector. The sector could contribute significantly to job creation by increasing its activity in promising areas such as the renovation of buildings. Construction and use of buildings in the EU account for about half of all extracted materials and energy consumption. 5—10% of total energy consumption across the EU is related to the production of construction products. The goal of the European Commission is to help the sector become more competitive, resource-efficient and sustainable. The EPBD is an instrument that could help work towards this goal.

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?

2500 character(s) maximum

Increased compliance and upgrading of skills and knowledge in the construction sector can be achieved by introducing targeted onsite inspections and developing certification schemes focused on securing competences amongst professionals. This can be done in a number of ways. A Delegated Act could outline minimum educational and training or experience requirements for inspectors and certifiers. Or, more detail could be added in a new technical annex to the EPBD, outlining minimum requirements for education and training or experience. Another possibility is to develop standards, like CEN standards for audits (EN ISO) and energy management schemes, such as EN ISO 50001.

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

2500 character(s) maximum

No, Eurocodes are well accepted standards for structural safety in steel, cement and related infrastructural constructions, including bridges. Energy performance would probably be difficult to smoothly integrate into Eurocodes. One area that indeed needs to be considered, either together with energy performance in the EPBD, or in Eurocodes, is fire safety. Fire safety is probably more closely related to energy performance, and thus should also be linked with the EPBD in some fashion, although possibly developed in a separate legislative initiative at EU level.

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

2500 character(s) maximum

Materials, waste and water use are not addressed in the EPBD, but in other EU legislative and non-legislative initiatives, such as Eco-design, Waste directive, TC350, PEF, sustainable construction platforms, and new building assessment tools. Materials, imbedded energy, waste and water use should continue be kept outside the scope of the EPBD. Sometime in the future, it will be necessary to make the EPBD into a sustainable buildings directive, but more work and consensus in the area of sustainability are required first.

J. Buildings systems requirements

The EPBD requires Member States to set minimum energy performance requirements for technical building systems (means technical equipment for the heating, cooling, ventilation, hot water, and lightning or for a combination thereof, of a building or building unit) in existing buildings. National provisions should not target specific products only (e.g. boilers) but should instead address building systems while also taking into consideration the building as a whole. Whilst the [Ecodesign Directive](#) governs the placing on the market of individual products, the EPBD sets requirements for their energy-efficient performance as part of the technical systems serving a building. The EPBD also requires regular inspections of heating and air conditioning systems. While the Directive does not specify what would be regarded as a 'regular inspection', it is the view of the European Commission services that inspections carried out at least every 7–8 years would be considered acceptable, whereas anything less frequent than every 10 years is likely to be problematic.

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?

2500 character(s) maximum

The setting of minimum requirements in the EPBD or in the Eco-design Directive for TBS are not happening currently. This is done at MS level, as set out in EPBD Art. 8(1). In the Labelling Directives, labels for "packages" of products, such as heat pumps and PV panels together in a "system", are being developed, based on tests used in eco-design product requirements. But this is not the same as system requirements. Minimum system performance requirements are difficult because the way the component parts are installed as a system has a strong impact on the overall system performance. In the future, system requirements should be developed and might prove necessary for nZEB, where e.g. noise from fans in ventilation systems must be limited because of the sensitive acoustics and sound levels in nZEB. In EED Article 27(3) MS are now allowed to set system requirements that may require higher product performance requirements than those established by Eco-design, provided the former do not constitute a barrier to trade.

73. Based on existing experience, do you think in the EPBD minimum requirements for technical buildings systems focussing on other factors than heating, air condition, large ventilation systems and domestic hot water e.g. certain building categories, building size, etc., is missing?

2500 character(s) maximum

Yes, for instance, lighting system requirements will probably be necessary, especially in nZEB, inter alia to avoid overheating, but these should include as much use of day-lighting as possible.

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?

2500 character(s) maximum

Yes, this is a relevant requirement to be set especially for large systems, as this is important to ensure proper performance.

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

2500 character(s) maximum

This is important and should be part of the installation contract, for example an energy performance contract would help to ensure proper performance through regular maintenance, with maintenance more often for larger systems.

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

2500 character(s) maximum

Yes, this should be part of the contract, and could even be included in an energy performance contract or a good maintenance contract. Insurance policies can be constructed to include regular maintenance that triggers replacement. This can also be applied to building elements such as components of the thermal envelope.

75. Have inspections required by the EPBD, been incorporated into or more tightly linked to other inspection/certification/energy auditing activities and schemes under other EU or national directives?

2500 character(s) maximum

ecee has no view on this question

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?

2500 character(s) maximum

In EED Article 27(3) MS are now allowed to set system requirements that may require higher product performance requirements than those established by Eco-design, provided these do not constitute a barrier to trade. Also, as nZEB becomes the norm, there may be more cases where conflicts arise. This means that Eco-design will need to be revised more frequently to keep up with nZEB product requirements.

K. Operational management and maintenance

After the completion of development and/or renovation works, buildings still use energy in a way that impacts building occupants and operators (e.g. via energy costs). Ongoing operation is a key part of a building's life cycle and is related to the goal of building NZEBs by 2020.

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

2500 character(s) maximum

The current EPBD does not ensure that buildings meet stringent efficiency targets at the operational stage, since in most MS, the MEPR are based on designed energy values, and not on actual energy performance. As a result, it would be relevant for the revised EPBD to also consider operational performance, while carefully considering the link between designed and operational performance.

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

2500 character(s) maximum

A number of investigations show that there is a gap between the-designed energy use and the actual energy performance of buildings. And this gap can be as high as 100%.

However, the reasons are well-known and are due to lack of quality in construction work, performance gap in components and systems, default design values in calculations not reflecting reality e.g. internal heat gains and indoor temperature and finally user behaviour. The EPBD should as far as possible address the lack of quality in construction work, which can be addressed by increased use of onsite inspections and better education, training and certification of installers and other construction workers. Performance gaps in components and systems should be better addressed by third party control schemes and technical standards. Default values in national calculation methodologies are a national responsibility. User behaviour cannot be addressed via the EPBD.

79. Based on existing experience, are the provisions provided by the EPBD to stimulate a proactive, innovative maintenance market effective?

2500 character(s) maximum

EPBD Articles 14 15, 16, 17 and 18 on inspection of heating and air-conditioning systems, inspectors and control schemes to check the inspectors, based on anecdotal evidence, seem to be too fragmented and heterogeneous to stimulate the maintenance market effectively. These need to be strengthened and complemented with improved articles in the EED, including Articles 16 and 18 on energy service providers. Improving the quality of the inspectors in many MS is very important, as has been pointed out elsewhere in this consultation.

L. Further Comments

Please include any further comments that have not been covered in the consultation

5000 character(s) maximum

eceee will submit a written comment by e-mail in addition to this web survey.

Contact

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