

EPBD Recast - EC Public Consultation

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2,500 characters per answer

Section A - Overall assessment

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

The EPBD's objective according to provision 33 of the recast was to enhance the energy performance of buildings, and it has been successful in doing so by:

- Creating a progressive EU framework for the improvement of building codes and standards by establishing a common methodology (CEN standards, cost optimality, EPCs) in a challenging sector, while giving MS the freedom to implement according to their national conditions, energy mix, income, type of building stock etc.
- Establishing the NZEB concept and asking MS to set relevant levels by 2018-2020. This model has set an irrevocable trend for new build, helping the sector move away from a component based approach, towards a more holistic low energy building design.
- The concept has initiated and begun to drive market uptake for energy efficient products, solutions and technologies, among which building insulation.
- Initiating a step towards energy renovations by putting in place minimum requirements for when a major renovation takes place (Art 6), although this has not triggered a shift in the existing building stock towards NZEB level.
- The EPBD has been important for initiating a process to increase awareness (EPC) and identify financial incentives and barriers (Art 10), the impact of which still to be materialised.

2. Has the EPBD helped improve energy efficiency in buildings?

- Yes. The EPBD helped improve energy efficiency in buildings by creating an important vision and legal framework for action through the progressive improvements of building codes and standards which have helped reduce energy consumption of buildings (albeit mainly in new build).
- Since the entry into force of the EPBD in 2002 and the subsequent recast in 2010 there has been a step by step progression (EPBD concerted action notes a 25% reduction in energy consumption). The inclusion of cost-optimality, NZEB, Energy Performance Certificates (EPCs) and the requirement to have minimum energy performance when undertaking major renovation are the first steps to improve energy efficiency.
- The EPBD has helped to improve the energy efficiency of *new* buildings, but there are some challenges linked to the definition of an NZEB building, the EPBD has not yet had the full expected impact. Additionally, the EPBD has not adequately stimulated progress on the energy performance of *existing* buildings through renovation.
- The principle and concept of NZEB should apply to existing buildings, but MS should now be encouraged to work out the levels at which these should be set. Aligning stakeholders around such objectives will help create market pull, as NZEB did.

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

- No, but the EPBD main focus was new build and the text should be assessed according to the intended objective. The EPBD has so far set requirements for when undertaking a major renovation effort (Art 6), and in parallel developed concept meant to increase awareness and drive demand (EPCs) and unlock some barriers. This has not had a tangible impact so far and has not led to a significant increase in renovation.
- The first requirement for MS to address the renovation challenge more holistically was the EED through articles 4, 5 and 20 specifically. It is now time to unleash the full energy efficiency

potential of the EPBD directive by ensuring proper implementation and strengthening the existing scope (to secure low H&C energy demand/information/financing) to help renovate our existing building stock towards an NZEB level by 2050.

- If we are to reach our efficiency targets, we will need to triple energy renovation rates, from about 1% of existing stock today to 3% but we must also address depth so as to enable the correct sizing of equipment, and prevent locking in voluminous portions of energy savings. This requires full coherence with the EED.

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?

- Partially. The EPBD through NZEB, EPCs and Art 10 (on financial incentives and barriers) has accelerated investments in energy efficient renovations together with available dedicated EU structural funds and framework programmes (i.e. EEEF, ELENA). However, more needs to be done to encourage the uptake of available financing (EU and national) to ramp up renovation.
- €60-100 billion is needed to be invested annually in EU buildings to achieve Europe's energy efficiency targets, yet current investments are below half of these requirements and five times lower than required to deliver 2050 (2015 EEFIG report). For existing buildings, what is needed is a long term stable regulatory framework, which would give confidence to investors that the efficiency in buildings is an area worth prioritizing investments.
- Owners also need visibility regarding performance levels to be achieved in the short, medium and long run, together with comprehensive energy efficiency upgrade packages that include financial solutions.
- Since renovation decisions are mostly taken at local level, the active participation of MS/regional and local authorities and consumers is essential in reaching our renovation ambition.
- The '*Smart Financing for Smart Buildings*' communique should include: a '*one stop shop*' access with expert advice for renovation and financing options for building segments (residential commercial, industrial). Eurima supports the following EEFIG recommendations:
- Long term stable and regulatory frameworks for financing, which require more awareness and projects like EFSI need more aggregators to enable projects like EnergiePositif;
- Review European debt and deficit restrictions and accounting rules to create flexibility for public spending on energy efficiency so that energy efficiency investments are less of a debt burden for MS;
- Energy efficiency as an infrastructure priority as is already the case in Scotland where energy efficiency of buildings is a designated National Infrastructure priority;
- Promote best practices such as the KfW scheme, which now also provide cross border lending to i.e. Bulgaria for boosting the energy efficiency of multi-family residential buildings
- Tackle barriers for a green mortgage market; reduced VAT on construction works involving energy efficiency improvements;
- Use of revenues from climate policies such as ETS should be used for investment in deep renovation of the building stock such as the case in e.g. Czech Republic. (2476)

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

- Yes. For new buildings the EPBD is contributing to the cost-effective improvement of energy performance (despite slow or varying NZEB implementation). Unlocking the savings potential of existing buildings can be better structured and channelled.
- Although the EPBD specifies the need to introduce minimum energy performance requirement at building level as well as component level, without ambitious building renovation policies, 4/5 of the existing cost-effective energy savings potential risk being left untapped by 2035 (IEA WEO 2012).
- Cost-effectiveness can be met through a package of solutions but since it is not well defined whether the building envelope is well or fully factored in and to what degree each building component should be optimized, this can lead to sub-optimal outcomes.
- Today, the lack of visibility regarding performance levels to be achieved for renovation prevents actors to exactly design such cost-effective packages for renovation.
- The cost-optimality regulation looks at minimum requirements and therefore MS should be encouraged to achieve energy efficiency beyond what is stipulated.
- Lastly, the cost-effective potential of energy savings measures could look very different if estimations were looked beyond € per kWh/m²/y and took into account the energy savings on the supply side, macro-economic, societal and health paybacks.

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?

- No. NZEB level across the EU28 ranges between 30 kWh/m²/y - 270 kWh/m²/y (Ecofys NZEB 2014), this has to do with lack of full implementation, unclear NZEB definitions, linked to MSs ambition level for climate and energy, and whether (or not) they prioritise energy efficiency in buildings.
- In particular, prioritisation should be given to reduction of H&C energy demand (largest energy consumption in a building) and addressed through a secondary level of requirement by setting a maximum absolute value (kWh/m²/y) for H&C energy demand, at national level. This will ensure that even with variances in energy use across building types, demand is being optimised adequately.
- Doing so also creates framework for similar ambition; ensures optimisation of the building envelope, which is the basis for high and well performing buildings and gives MSs the flexibility to decide the value based on their building stock.
- It is important that a similar level of ambition (subject to national context) is applied in a coordinated and planned way, so that MS can self-accelerate the transition into an NZEB level building stock - for new and existing buildings.
- By undertaking deep renovation of this kind, by 2040 roughly, the equivalent of the 2011 EU domestic energy supply would be sufficient for all H&C energy demand in the EU buildings (Ecofys Deep Track Study 2012 and Ecofys Deep renovation of buildings 2014).

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

- No, the EPBD has not adequately stimulated progress on the performance in existing buildings'. Addressing existing buildings and accelerating staged/deep renovation (within the existing scope of the Directive) should be a priority in this assessment.
- The NZEB model has established a long term vision for new build and has been a market trigger. An objective based on similar principles should be set for the renovation of existing buildings to reach its full efficiency potential.
- Due to the fact that a major renovation takes place only each 30-50 year, securing the right regulation/policy is important so that consumers can make the best decisions for their situation at the right juncture and markets are given investor certainty.
- This paradigm shift can only happen by having a vision for the existing building stock:
 - **The 2050 Vision.** In order to accompany the '*minimum requirements*' based piece of legislation with an '*objective based*' legislation the EPBD should introduce a consistent long term objective which is familiar to MS, that includes indications on energy demand for our existing building stock. The vision should be to have an NZEB level stock by 2050.
 - **Establishing milestones.** Establishing milestones for 2030, 2030, 2050 where by the worst performing buildings are progressively targeted (to trigger market dynamics) will ensure continued commitment and help stay on course towards our long-term energy efficiency and decarbonisation goals. These should be reflected in MS national renovation plans/roadmaps Art 4 EED.
 - **Translating goals into reality.** In order to provide MS with the necessary guidance, in particular those with less progressive building codes or those more reliant on EU legislation, these objectives should be defined for building segments (public buildings, residential, commercial etc.) and include a renovation toolkit (JRC 2015 report).
- There are also additional enablers within the EPBD that need to be strengthened to encourage renovation. For example, the inclusion of appropriate definitions. Consistency should be looked for between NZEB definitions for new and existing buildings and the concepts of deep and staged deep renovations. Others enablers include, improving the quality of EPCs, increase skilled people, and facilitate better on-site inspections, increase awareness and information about renovating buildings (for different segments) and comprehensive energy efficiency upgrade packages that include financial solutions. (2473)

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

- Yes, The EPBD has set effective standards, which have encouraged incremental changes for new buildings: the recast applying to the full building stock, cost-optimality to develop minimum requirements, and the inclusion of NZEB - key elements for a lasting change. However, some of these 'standards' such as NZEB are nebulous.
- Even though half of EU MS now have NZEB definitions in place, they are in some cases vague

and set according to national ambition levels. Because NZEB does not prescribe a common approach to implement NZEB nor do they describe the assessment categories, this has led to fragmented/piecemeal actions to reduce energy consumption which today range between 30 -270 kWh/m²/y, with no clarity on how much demand is being reduced through adequate measures. A failure to optimize the available demand reduction potential, places some MS further away from where technologies can bring the markets in 2020.

- We propose setting secondary requirements setting a maximum absolute value (kWh/m²/y) for H&C energy demand, at national level to secure a low energy demand of nZEB buildings. This will ensure that even with variances in energy use across building types, the demand reduction potential is being optimised adequately. Taking such an approach is also in line with the principles trias energetica and Energy Efficiency First. By way of example, the Passivhaus model has a long track record of success where requirements were set of 15kWh/M²/y for heating and 15kWh/M²/y for cooling.
- Buildings are part of a transitioning energy system. As we modernise infrastructures, shift away from a fossil fuel based and dependant society to a decarbonised, decentralised and flexible energy system highly efficient buildings can also reduce infrastructure investment, bring supply side flexibility through a reduction of the overall base load combined with a reduction in system peak (Ecofys, Energy efficient buildings in the future power system 2015). In order to obtain such benefits, it is essential to prioritise the reduction of energy demand need for H&C. Also, energy supply and demand policies must be well coordinated.
- Due to the moderation of H&C energy demand in buildings, and the vast potential for savings in existing buildings, it is important that the EPBD review avoids favouring an expansion of the system boundary (beyond building level) for new or existing buildings, and falsely pre-empting an increase in energy use or lack of consideration of demand reduction potential, which may discourage investment in energy efficiency measures such as renovation.

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

- Most likely the NZEB target of 2020 will not be met. There are several reasons for this:
- The main problem is the ambition gap between MS NZEB definition and the EPBD NZEB ambition being really “nearly zero energy”. Even in cases where MS do reach their NZEB target, it will not necessarily be ambitious enough in relation to the cost-effective potential level, using existing technology and proven markets solutions;
- Experience from e.g. DE, FR and DK has proven that the learning curve improves fast when MS introduce a clear pathway for adoption and introduction of NZEB level requirements. Unfortunately most MS did not introduce intermediary levels for NZEB early enough;
- Therefore, it is very important to adopt a NZEB target, but it is equally important to develop a roadmap to implement it, giving investors and market players the regulatory predictability and stability needed to drive 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 require further development;
- Due to the absence in uniform understanding/applicability of NZEB (varying ambition level, and reporting across MS through numerical indicator for primary use, energy performance classes and sometimes only for single houses vs buildings) it is difficult to measure if NZEB has been actually met. In addition, There is not enough guidance on what NZEB levels should aim for in term of energy consumption (templates were only designed in 2013/14);
- The learnings from the German Passive house concept, where a requirement for the maximum energy need for H&C has been included as part of the definition, and an equally important a stringent process applied, strict oversight of the design and construction has proven to be good tool to design very low energy buildings in a cost optimal way;
- A clearer definition for NZEB and guidance for renovation towards NZEB should be considered, as it could have the same pull effect as NZEB did for new build. Like for new build, a low energy demand for heating and cooling should be aimed for.
- Best practice examples of already realised NZEB constructions for new build and existing could be collected in a central European wide database where performance has been documented, and used as guidance for other MS. (2389)

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?

- EPC's are a valuable and important tool- they help create visibility but need to be better deployed and their quality enhanced to reach the desired level of impact.
- EPC's role of empowering consumer to know their building performance can be an important trigger to undertake improvements, in particular at the point of sale (providing information in form of an investment grade audits/payback periods etc.). EPC's should therefore be applied to all buildings and there should be mandatory EPC database at MS level that can be accessed by real estate agents (to ensure informed sales).
- The lack of tailor made recommendations in the current EPCs prevents the uptake of energy efficiency measures and investment revenue generation for investments in renovation. Therefore improving the quality and reliability must be enhanced.
- Recommendations for improvement include: the quality of the EPC needs to be improved by controlling the experts skills but also implementation, EPC convergence across members states, improvement of the certificate and the energy audits upon which they are based, increasing the no. of appropriately trained experts, ensuring compliance through mandatory on-site inspections by certifiers, that national EPC databases are made public, better linking EPCs and access to financing, and finally ensuring applicability of EPC's to all buildings.
- The aim must be to develop the EPCs to become a real dynamic tool to support renovation through accompanying owners in the renovation process, namely individual renovation roadmaps or renovation passport. For commercial or industrial facilities some learning could be drawn from the concept of investment grade audit.

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

Worked well is the introduction of:

- A progressive framework for building requirement improvements
- Introduction of Art 4 on cost-optimal levels and minimum requirement to review every 5 years
- Introduction of Art 9 on NZEBs
- Introduction of Art 11 on EPCs

Improvements are needed in the area of:

- Cost-optimality, which looks at minimum requirements - MS should be encouraged to achieve energy efficiency beyond what is stipulated, and C-O benchmarks tightened from 15% to 5% (see also Q21).
- Accelerating the renovation of existing building stock to NZEB level, by setting a clear vision with milestones.
- The NZEB definition needs to be more precise securing a minimum performance level of the building envelope, e.g. by including secondary level requirements (kWh/m²/y) for H&C, energy demand defined at national level.
- EPCs (quality, reliability, renovation passport/ investment grade audits and application to all buildings)
- Compliance (quality of works, on-site inspections and skilled workforce)
- Special attention to trigger points to set specific requirements for the existing building stock as has been done in several MS and regions: Within a specific timeframe (DE); When undertaking works for technical or aesthetic reasons (FR); When renting a property (UK and BE); At change of use of building (DK) and at change of use of building (DE- Baden-Württemberg) (see BPIE best renovation practices 2015).

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)?

- Yes. The building stock is the single largest consumer of energy in Europe, consuming 40% of final energy and contributing to 36% CO₂ emissions. 75-90% of our current EU building stock is inefficient, and will still be here by 2050. Deeply renovating our building stock is the only way to reach our energy and climate objectives.
- The 2030 Council Conclusions called the identification of priority sectors for significant energy-efficiency gains. The 2013 Fraunhofer study (Analysis of a European Reference Target System for 2030) and 2009 McKinsey abatement curve clearly note that the biggest cost effective savings potential lies within the existing building stock, which can reduce its energy by 61% in 2030

(residential sector), therefore drivers for renovation, must become a key priority.

- The Energy Union Strategy recalls the building sector, the area with the biggest savings potential, and the EPBD is the key instrument for addressing this. Through ambitious, deep renovation of the building stock, we could reduce the sectors energy imports by 20% by 2020, 60% by 2030 and 100% by 2050 and we can reduce the energy consumption by 80% towards 2050 - improving our buildings must be a key part of the EU energy and climate goals.
- The IEA's 2015 energy and climate outlook bridge scenario to stay within a 2°C outlines five measures of which the first is increasing energy efficiency in the, inter alia, buildings sector. It also notes that implementation of the EPBD actions to overcome market barriers support more rapid renovation of the building stock. As in similar IEA countries, in Europe, without improved policies, more than 80% of the energy efficiency potential in buildings will be remained untapped (IEA WEO 2013).
- The post 2020 Effort Sharing Decision (ESD) is also an important instrument to help achieve our 2030 goals for the sector as a whole. The ESD should be a driver for achieving a more and better energy efficiency action in building sector.

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

- Yes, the EPBD is fully in line with the principle of subsidiarity.
- Article 194 TFEU subpoint 1(c): *Union policy on energy shall aim, in a spirit of solidarity between Member States, to: ... (c) promote energy efficiency and energy saving and the development of new and renewable forms of energy; ...* . Thus, energy efficiency and the moderation of demand is a clear EU competence.
- The creation of an EU wide methodology (NZEB) is important for creating and sustaining energy efficiency markets. It also encourages the development, adoption and enforcement of progressive codes and standards (at local, national or regional levels), which would not be in place otherwise. Regulatory drivers such as the EPBD requirements are catalysts for action at MS level, are the most effective tools to achieve our energy efficiency goals but also provide investor certainty and function as drivers for energy efficiency products/developments in the construction sector.
- Moving forward, the EU must set the vision and the respective level of ambition towards a deeply renovated and highly efficient EU building stock by 2050, which is the foundation for a cost efficient transformation to a low energy - low carbon future. Such as vision should include a mapping of the pathway(s) to cost-effectively achieve this, taking into account also societal, health and supply side impacts.
- At the same time, it is important that MS are able to define their own specific level of ambition contributing to such a deeply renovated and highly efficient EU building stock by 2050, considering the potential of their own building stock and specific building types, their climate conditions, and socio-economic conditions.

14. Are the objectives of the EPBD delivered efficiently?

- The objectives of the EPBD have been partially delivered (*although is unclear what is precisely meant with the term 'efficiently'*). Much of this has to do with the fact that the recast was implemented during the worst crisis since the 70's, some MS are yet to fully transpose the directive and that NZEB was not fully clear.
- See responses to 1, 2, 5 and 11.

15. Has the EPBD created any unnecessary administrative burdens? Provide examples

- From our industry perspective the EPBD has not created any administrative burdens.

16. Has the EPBD created any unnecessary regulatory burdens? Provide examples

- From our perspective the EPBD has not created any regulatory burdens. Rather, regulatory signals such as building codes create much needed certainty for industry.

Section B - Facilitating enforcement and compliance

17. Is compliance with the provisions of the EPBD adequate

- No, since only 50% of MS have a view on compliance rates of new buildings (BPIE), compliance in the EPBD could be improved.
- More importantly, ensuring quality of the building requirements /works is about having an effective compliance system. Effective compliance means having procedures, a legal framework and enforcement.
- The 2015 QUALICHeCK assessment and BPIE evaluation show that several aspects require attention: calculation methodology (comparability), standards for certifiers quality control, on-site inspections, requirements for MSs to improve their sanctions & penalties system (e.g. as is already the case in Flanders Region of Belgium and Ireland), verification of calculation software, airtightness tests and checking of compliance after completion of works/ temporary certification for new buildings.
- The following compliance measures should be considered to track progress; the development of awareness-raising actions in order to broaden societal support; an increased guidance from the Commission to Member States to ensure that more information is available (e.g. creation of one-stop-shops/NZEB benchmarks); and incentivising compliance with quality requirements through a link to financing (e.g. as in Lithuania), and through an increased ex ante conditionality for EU funds and other public funding in countries.
- When it comes to improving the quality, thus the actual performance of the works, the process applied matters: stricter oversight of the design and construction will be necessary to achieve NZEB. Specifically an increased requirements for validation of airtightness and thermal bridging design and construction.
- On NZEB compliance (some MS still have to submit NZEB definitions and submit NZEB plans), there seems to be an overall reluctance to fully and ambitiously implement the measures set out in the EPBD. There are a variety of reasons; political priorities, varying level of energy and climate ambition at national and local level, lack of information to building value chain (and home owners), differing building stock, building codes, granting of permits and respective design phase completion time, economic crisis, financial constraints etc. (2054)

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

- No. The definition of NZEB is not sufficiently clear. See also responses to Q8 and Q9.
- MS have defined NZEB according to different understandings (i.e. parameters/indicators for quality and quantity) this has resulted in varying ambition levels with no measurable criteria or a common benchmark. Some MS outline primary energy, in other countries carbon emissions are used as the main indicator, while in others carbon emissions are used as a complimentary indicator to primary energy. Furthermore, as the type of buildings varies considerably so does the eventual maximum primary energy level which currently is between 30 -270KWh/m²/y.
- In addition, sometimes there are numerical values for primary energy and qualitative values for the share of RES. A criterion for NZEB renovation has been identified in 13 jurisdictions but definitions only in 8 MS (BPIE NZEB implementation). In other instances, MS apply the same NZEB definition for new build as for existing and others have different criteria.
- A revised NZEB definition should apply the trias energetica and Energy Efficiency First principle, which makes clear that demand moderation should be maximised. Introducing a secondary requirement limiting the energy demand for H&C could be used to safeguard the performance of the building envelope.
- Due to investment cycles and added value of ensuring a maximum energy demand for need for H&C, a secondary level of minimum requirement (kWh/M²/y) will ensure a minimum quality of the envelope thereby providing thermal and health comfort, and making the building resilient in the context of uncertain supply transition. A practical application for both new NZEB and existing buildings with clear benchmarks should be considered. (1813)

19. Is the definition of NZEB target in the EPBD sufficiently clear?

- If by 'target' is meant the 2018 - 2020 date, then yes. Otherwise no. The NZEB target has been more clearly defined for new buildings than for existing buildings.
- MS are asked to draw up plans on how they intend to reach NZEB, a similar roadmap should be set for the existing building stock and made compatible with the article 4 of the EED. This should include long term targets/milestones and benchmarks on H&C energy demand for example a maximum (kWh/M²/y), which is to be defined at national level. However, an EU level benchmark

may be a useful approach to help all MS to raise the ambition level to become close to best practice.

- Further guidance is needed to define NZEB levels for existing buildings, along the principles for new NZEBs, e.g. in the light of the work realised by the BPIE led COHERENO project.

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

- a. Minimum energy performance requirements in new buildings? **same response**
- b. Minimum energy performance in major renovations of existing buildings? **same response**
- 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.)? **Same response.**
- d. Minimum renewable energy requirements to meet the NZEB target by 2020? **No reply**
- e. Certification of the energy performance of buildings, including tailor-made recommendations for improvement of the energy performance of buildings? **Yes.**
- f. With Regular inspections of heating and air-conditioning systems? **No reply.**

- The biggest challenge within buildings is the 70% of energy needed for H&C demand. In order to effectively address the gap between the role of the building envelope and how MS are pursuing varying NZEB definitions: the EPBD review must consider setting secondary level requirements for NZEB and existing buildings, through the inclusion of a maximum absolute value (kWh/m²/year) for H&C energy demand, to be defined at national level.
- The German Passive House methodology and processes could be used as inspiration, as it now has a long track record and have been proven to work.
- The EPBD review must avoid favouring an expansion of the system boundary (beyond building level) due to a false pre-empting of an increase in energy use, which discourages investment in renovation.
- In addition, certification (limited validity) of inspectors/auditors (minimum requirements for education level, including training & working experience) and on-site inspection of new build and renovation/replacement is a very efficient tool to ensure both compliance and quality.

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 NZEB?

- Yes. Cost optimality has now been used in all MS, as a way to assess the optimum level and possible gaps with building codes; it was particularly useful for those MS with less progressive requirements. However, given the flexibility it does not necessarily trigger developments towards NZEB. The CO benchmarks should be strengthened and reduced from 15% to 5%.
- Cost optimality can be met through various packages of measures and there is no clarity about whether the benefits of a well performing building envelope are actually well factored in. There are also various challenges in implementing cost optimality and NZEB, factor such as selection of reference buildings, package of measures, primary energy actors, and discount rates cost of material and equipment.
- For NZEB, there is a large flexibility in defining this according to national approaches, there is no EU comparative methodology, or any consequences for not being cost-effective or affordable (BPIE, is cost optimality leading to NZEB, 2014).
- Depending on factors such as the discount rates used or energy prices, NZEBs levels established for 2020 will 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.
- We welcome the recent signals from the Commission about a revision of the discount rates applied to energy efficiency measures in the Commissions Primes modelling to 10-12% - as this will affect not only investment in high energy efficiency scenario's but also have a clear impact on subsequent legislation i.e. the EPBD and EED. To avoid pre-empting energy efficiency policies or carrying out retro-active modelling, the 2015 discount rates should already be used for the reviews of the EPBD and EED, which are currently in progress.
- It is important that the Guidance Notes for the CO Regulation, and EPBD Art. 7 for new build (incl. NZEB) and components are consistent.
- Eurima understands that the Commission is currently undertaking a study on cost optimal performance requirements and would welcome these insights.

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?

- Yes. Ensuring quality, is about having an (available) informed and skilled workforce and building value chain, the right administrative support and an effective compliance system that has repercussions for non-compliance, as is the case in Flanders (where there are penalties/sanctions for non-compliance).
- Guidelines that seek to achieve energy efficiency beyond what is stipulated in base code are increasingly common, as is the case in Denmark. Some jurisdictions also accelerate the paperwork process for developers that meet the requirement to increase energy efficiency or green building standards (IEA Medium Term EE report).
- See also response to Q17 on compliance.

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

- Cost-Optimality Regulation provides a benchmark for only minimum energy performance requirements and even then calculation methodologies differ between MS. The use of different input parameters, varying definitions of “useful floor area” and considering differently the technologies by the amount of energy from renewables captured leads to gaps and non-comparability. The CO benchmarks should be tightened from 15% to 5%.
- Better data availability, comparable information and use of similar parameters (coming from better definitions) will help calculating building performance.

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?

- An increased level of on-site inspection (through a skilled workforce) focusing on the quality as well as compliance will help to improve the asset value and help avoid otherwise expensive mistakes to be made.
- When it comes to improving the quality, the process applied matters: stricter oversight of the design and construction will be necessary to achieve NZEB. Specifically an increased requirement for validation of airtightness and thermal bridging design and construction. For public buildings such on-site inspections should be part and parcel of maintenance contracts.

Section C - EPC's and stimulating energy efficient renovation of the building stock

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

- No, the data available is not sufficiently clear to provide a comprehensive overview of the energy performance of the EU's building stock.
- The data available to date already allows decision-makers to draw some conclusions and to kick start bold renovation programmes (i.e. 70-90% buildings inefficient from a thermal perspective, current renovation rate are not sufficient, high share of energy absorbed by buildings).
- However, in order to plan the transition to an NZEB level EU building stock by 2050 - it is essential that we have a much more comprehensive and detailed overview of the EU wide building stock with a proper building repository. If data is not measured /collected systematically it will not be comparable and this fragmentation will reflect in national levels of requirements.
- With a building repository (including energy consumption, floor area, thresholds etc.) we create the right foundation for identifying the suitable policy and financial measures for structural change that take into account regional specificities; in particular for renovation in MS where GDP is below EU average and the most support is needed. Such an effort requires the commitment of the EU and MS.
- Collecting data at the building site is also important for energy performance rating and a reliable and effective EPC. Therefore introducing mandatory on-site visit when issuing EPCs should be considered. Because of the fragmented EPC market, a revised EPBD should introduce mandatory EPC databases at MS level and an accompanying EU repository.

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?

- The success of long term renovation strategies is dependent a holistic approach which is coherent and consistent between the EED and EPBD.
- Long term roadmaps are a key starting point for renovation, however they must provide a long enough horizon (due to long investment cycles) and clear targets (rate and depth) through a sufficient focus on realising gains through the building envelope. As outlined in Q7 long term renovation strategies should include: a vision - an NZEB level EU building stock by 2050. Establish clear criteria and milestones (reduce energy demand by setting a maximum H&C energy demand, defined at national level and progressively target the buildings sector), which should then be translated into reality through renovation toolkit.
- The 2013 guidance document by the WG on CA EED, CA EPBD and CA RES outlines 9 steps in the renovation strategy formulation process. Such guidance, like those developed by BPIE and Policy Partners should be further promoted with a view to achieving an NZEB level building stock by 2050. The 2014 BPIE report on Art 4 EED, notes that current strategies do not provide confidence to building owners to invest in building renovation. More importantly, MS long term strategies as they stand now are not forward looking, not time bound (+ should be) and lack an obligation to implement.
- In terms of best practice, the BPIE best renovation practices report, outlines a variety of ways of stimulating the renovation market across different building. There are voluntary schemes which show variety of approaches and solutions tackling the renovation challenge, whether it is in terms of scale, financing, addressing non-technical barriers, level of ambition or achievement of social objectives (Habiter Mieux, KfW, Energysprong/stroomversnelling, Kredex etc.).
- The report also outlines five “trigger points” for renovation: 1. Within a specific timeframe DE 2. When renting a property - UK 3. At change of use of building - DK, 4. When changing a boiler Baden-Württemberg, DE, 5. In case of an extension to the building surface -IT.

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?

- EPC's are an important information tool but there is no evident connection to an increase in renovation rate.
- EPC's need to be applied to all buildings, based on a proper audit, be more comparable, accessible (also to realtors), increased communications to building owners around EPCs, and their recommendations taken up both for the improvement of the building stock but also to trigger further investment into renovation.
- The aim must be to develop the EPCs to become a real dynamic tool to support renovation through accompanying owners in the renovation process, namely individual renovation roadmaps or renovation passport. For commercial or industrial facilities some learnings could be drawn from the concept of investment grade audit.
- See also Q10.

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?

- Renovation rates are currently 1.% per annum, aiming for tripling the renovation rate to 3% will not sufficiently drive change, what is needed is minimum energy renovation target, this means not just refurbishing a % of the building stock but ensuring that all renovations are deep or staged deep renovations and are geared towards reaching NZEB level by 2050.
- The long-term, NZEB level objective for the existing building stock, set at national level, will also give MS the flexibility to decide on what this means in terms of depth, rate and the volume of savings that can be realised through renovation, therefore respecting the principle of subsidiarity and allowing for variations in typologies across Europe.
- Bringing the existing building stock up to NZEB level will require different benchmarks for energy demand (as compared to the definition for new build) and setting a maximum H&C energy demand (kWh/M²/y) defined at national level would establish a first harmonised step towards this goal.
- Efforts to reduce the energy use in existing buildings must respect the principle of energy efficiency first, optimizing demand reduction of the building, giving guidance to MS, and ultimately

helping create market convergence. Without a clear vision and concrete secondary level requirements we risk non-action, poor investment decisions into projects with less societal/economic ROI and end up with marginal energy savings.

- For coherence and because public authorities are the leading example for change, there should, in addition, be a renovation obligation of all public and buildings funded via public money to be upgraded to the EU benchmark before 2050. This approach would also help address the fact that 22 MS have opted for an alternative approach in Art 5 EED (Coalition for Energy Savings report on Art 5).
- See also Q26 on best renovation practices that offer replicability (BPIE report on best renovation practices 2015).

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?

- Yes, there are some important obligations missing from the EPBD.
- To help the directive meet its goals we should consider setting secondary level requirement for H&C energy demand by setting a maximum absolute level (kWh/M2/y), defined at national level e.g. supported by a an ambitious EU benchmark.
- As regards renovation, there are individual Member States, regions and cities that have gone further, introducing various forms of 'regulatory signals' for renovation in connection with "trigger points" these should be considered further as part of the EPBD (BPIE best renovation practices).
- The EPBD should encourage that energy renovation is integrated to changes or works happening anyway:
 - Energy efficiency needs to be linked to the everyday renovation market, incl. DIY market;
 - Trigger points should be maximized to perform energy savings works at the best moment, e.g. change of tenants or owner;
 - Integrate energy renovation into other types of works (aesthetic, equipment, technical, facelifts, roofing, etc.) thus facilitating staged renovations;
 - Develop regulatory signals for poorest performing buildings to be renovated (cf regulatory developments in FR or UK), ensuring that this is done in combination with a whole house approach.
- Please also see responses to Q26 and 28.

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

- EPC are not requested to be designed in a way that makes them easy to compare and harmonise. They require improvement if they are to trigger a shift of our existing building stock into NZEB levels:
- Improving implementation, notably of the most cost-effective recommendations included in the EPC in a certain medium-term timeframe;
- Extending and rebranding EPCs to Building Passports, which follow the building throughout its life, are linked to a national database, and accompanied by steps to undertake to achieve a targeted level of energy performance;
- Ensuring applicability of EPCs to all buildings, and developing national, publicly available, EPC databases (using IT tools);
- Develop one-stop-shops to advice consumers and local authorities on planning and financing energy renovations;
- Better linking EPCs and access to financing (require investment grade audits), in order to fiscally support deep energy renovations (EPBD Article 10 in coordination with EED Article 20);
- Increasing the number of appropriately trained experts;
- Ensuring compliance through mandatory on-site inspections by certifiers.
- Not least, given that the EPBD should remain focussed on the current system boundaries (performance of the building), EPCs themselves should remain focussed on the performance of the building, as a tool meant to make the energy performance of a building visible and encourage renovation.
- See also Q10 and Q22, Q27.

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

- No, it is not defined in the EPBD. On the whole there ought to be more and better definitions included in a revised EPBD. The construction sector has evolved; there are more solutions, innovations etc. so there is clear need to ensure that MS have the same point of departure when implementing policies.
- Within the category of building renovation, more precise explanations should be given of deep and staged deep etc. This could include setting benchmarks and introduce a guideline for the maximum H&C energy demand in buildings.
- Eurima supports the following definition of staged deep renovation: *deep renovation* of a building that takes place either at once or in a series of planned stages, whereby stages are being made compatible between each other through a holistic analysis of the savings potential and as a results the costs of undertaking a particular stage does not preclude or increase the costs of carrying out subsequent stages.
- The objective of a staged deep renovation should be to reach the NZEB level over time e.g. in the light of the work realised by the BPIE led COHERENO project.

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?

- Although more owners are becoming aware of EPCs (largely as they have to provide them at point of sale), the awareness level of the value of an EPC across tenants is still low. This is linked with fact that works on the building envelope or technical measures are carried out by experts that are either not in contact with tenants, or where the installers take decisions for them. This is more generally linked with the absence of visibility regarding long term goals. Currently EPCs are largely 'a piece of paper' - they are not being used sufficiently as a tool to increase renovation rates. In fact, only a few Member States have schemes in place or in the pipeline which use EPCs (such as the UK).
- Selling and letting agents are important interlocutors for spreading information effectively in their publicity, but the accessibility of EPCs is not possible in some MS. In other instances, even if the knowledge/understanding is there it does not mean that home owners are encouraged to take on renovation measures. Unless there is a guided system, advised by an expert, that looks at the building in a holistic way advising on the best measures - we still risk owners undertaking 'quick and easy' but not necessarily the best long-term renovation measures. This is precisely what tools like individual renovation roadmaps or renovation passports enable to fix, namely by suggesting a well-coordinated energy improvement plan.
- EPC's can be extended to a building passport, which follows the building throughout its life and is linked to a MS database. Such a passport would be accompanied by steps to undertake to achieve a targeted level of performance. It would improve the quality of staged deep renovation, and enable energy renovation to be better integrated in other interventions.
 - While listing and describing energy efficiency measures to be implemented to achieve the target performance, the passport will also suggest when and how they can best be pursued. It will also provide a clear understanding of the possibly expected benefits and co-benefits (energy savings, reductions of CO₂ emissions, thermal and acoustic comfort, fire safety, indoor air quality, etc.)
 - By recording also the actions and measures actually implemented in the building (what solutions, what materials, date of installation, etc.), it will facilitate, over the building life time, the repair, maintenance and end of life management of the different building elements.

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?

- See Q10, Q22, Q27 and Q30. Yes, EPCs should be made mandatory for all buildings and linked to clear improvement plans for owner (renovation strategies). But first the review of the EPBD should consider improved quality and full implementation of EPC.

Section D - Financing energy efficiency and renewable energy in buildings and creation of markets

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

There are several reasons for insufficient take up of the available financing and reasons that prevent people from undertaking renovation - even when finances are not an issue per se. These include:

- Complexity of works
- Lack of trust towards professionals
- Lack of visibility regarding performance to be achieved (how far do I go to make my building fit for the future regulatory environment? I have no idea what the average level will be in 10 years).
- Lack of accompanying structures & services: people are not expert but have to decide about: type of work, level of performance, choice of solutions / materials / choice of professionals etc.

Specifically on financing:

- Different buildings require different instruments depending on the type, use and owner profile. Sometimes, one instrument will fail, while the other will succeed, despite providing the same financial terms and benefits, just because the target audience does not understand the math, it is important that financial schemes target particularly building types/owner profiles.
- Owners of both new build and existing buildings need comprehensive energy efficiency packages that include financial solutions - these are not easily and readily available.
- Although, the EFSI and EEPF important funds to leverage private sector investment, they require an aggregation of projects - these funds need to be more widely communicated about and active interlocutors established.
- Eurima supports EEFIG recommendations for long term and stable regulatory framework, a '*one stop shop*' access with expert advice for renovation, and financing options for building segments.
- For building renovation both structural and long term financing schemes such as EU funds e.g. (Kredex), Schemes like KfW in DE (which also provide cross border lending to i.e. BG for boosting the energy efficiency of multi-family residential buildings). Or reduced VAT on construction works (case of Lithuania - JESSICA), on-bill financing and split incentive scheme developed, tackling barriers for a green mortgage market to move to NZEB level, the use of revenues from ETS for energy efficiency projects such as renovation (as is the case in CZ).
- Other barriers factors such as debt and deficit restrictions under the Treaty for Stability Coordination and Governance are also hindering the uptake of finance by public authorities (see also Q4).

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

- Lack of understanding of how energy improvement realised will impact the value of the building and its operational costs;
- Lack of long term strategic initiative by building owners and municipalities. As renovation decisions are mostly taken at local level, the active participation of MS/regional/local authority's and consumers in reaching our renovation ambition is essential. Local authorities are best placed to raise awareness and support/facilitate easy and accessible energy efficiency projects.
- Lack of interlocutors. That can aggregate to increase the size of projects or a one shop stop (with skilled advisors) at local level that advises on building renovation funds that can be tapped into.
- Lack of political commitment to energy efficiency. Economic analysis shows that investments in energy efficiency - such as energy renovation of buildings, improving industrial production processes and building more efficient energy infrastructure - perform as well as or better than other forms of infrastructure investments in terms of tax revenues and jobs created as well as the overall impact on GDP and balance of trade. At the local level, energy efficiency investments in buildings improve air quality and health while alleviating fuel poverty and mitigating the intermittency of renewable energy sources. In Scotland for example, energy efficiency of buildings is already a designated National Infrastructure priority.
- Structural barriers to EPC/ESCO (risk sharing) can work (i.e. REFIT ELENA UK) but do not necessarily trigger renovation at the desired or quality level. This is the reason a review of European debt and deficit restrictions, and accounting rule create flexibility for public spending on energy efficiency, so that investments are less of a debt burden for MS are needed.

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

- In order to help citizens and MS facilitate deep or NZEB renovations, the EU should first evaluate and remove all structural barriers to finance deriving from EU regulation (e.g. debt, accounting, public procurement and state aid rules).
- Financing tools need to be easily accessible, standardised, cheap and available on a long-term basis, and regulatory stability has been identified by investors as key.
- The EU should subsequently: task Member States develop 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 continue to be developed. An optimal level of leveraging for the use of public funds to mobilise private investors needs to be established.
- Ensure that public financing, EIB confirm eligibility and fast track for financial instruments relating to energy efficiency. The EFSI fund and the continued support for aggregate project as is the case of Energie Positif (FR) and the EEEF are important funds that have proven to work. They now need to be scaled up.
- See Q34 and Q35.

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

- Market subsidies for fossil fuels do not support energy efficiency in buildings. They should be phased out. Subsidies distort market price setting and these funds can be better used to trigger financial investments in our energy transition. Investment guarantees are needed to trigger private investments for deep renovation, energy efficiency investment schemes, in particular because of the gains (lower bills, reduced dependence).
- The wider issue of fossil fuel subsidies is that give a distorted impression that energy is 'cheap'. And undoes what MS try to do with "awareness raising" programme encouraging people to do savings to cut bills and reduce energy consumption.

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

- No, energy efficiency and renewable energy projects have not been combined to maximise their financing.
- Eurima welcomes the concept of smart buildings as defined by EuroACE, which sees buildings as part of the wider energy system and recognises the local environment and energy mix. In this context a smart building is one that is well designed, has low intrinsic energy demand, is comfortable (and has a healthy indoor environment, has the right materials and equipment, connected to the grid and has a cost-effective use of renewable energy sources and can ultimately empower the consumer to take the best decision for them and their situation.
- As we modernise infrastructures, shift away from a fossil fuel based and dependant society to an decarbonised, decentralised and flexible energy system highly efficient buildings play a key role as they can reduce infrastructure investment, bring supply side flexibility through a reduction of the overall base load and system peak (Ecofys energy efficient buildings and the future power system 2015). As such, a well performing building envelope should remain the precondition for smart buildings, as ensures resilience, irrespective of the energy mix or available building systems technologies.
- Maximising the envelope potential also safeguards against inevitable changes on the energy supply side, prevents the lock-in of voluminous portions of savings and avoids having oversized H&C and cooling distribution system ending up as stranded assets.

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?

- Investment in high performing buildings is stimulated by legislation such as NZEB, which sets a requirement for MS to move towards an efficient building stock.
- However, too little has been undertaken to phase out worst performing buildings. The issue is partially addressed through dedicated programmes for renovation in the social housing sector, but this does not necessarily lead to a systematic phasing out of the worst buildings.

- The lack of progress is due to
 - The lack of long term goals for the building stock itself, and
 - The absence, until very recently, of regulatory signals to trigger renovation of the worst performing buildings. Indeed, as it has been demonstrated, e.g. through the work of The Shift Project on the French residential stock, meeting long term decarbonisation targets for the building sector cannot solely rely on incentives, since incentives are not sufficient for owners to act, and take a decision to upgrade their building.
- The most effective ways of phasing out worst performing buildings is to develop a long term ambition for the EU building stock, leading to national long term national strategies, where the national goals and circumstances are reflected. The level of ambition being set, policy needs to focus on developing a progressive regulatory framework to meet the long term goals, in which incentives, financing, and the regulatory push have their role to play.
- The most effective ways of phasing out worst performing buildings is through an EU wide signal, complemented with national regulatory signals such as those recently by some member states (KfW, Energysprong, Habiter Mieux -see BPIE best renovation practices study and Insight-E report)
- The existing approach in this area is therefore far from sufficient. 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 lacking, they are complicated to apply for, or have a very limited life time. In addition, subsidies and financing often lead to sub-optimal renovations. This locks in much of the potential. Legislation targets/benchmarks and guidelines at EU level are needed to correct this.

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?

- It should be noted from the outset that, the issue of split incentives is one that is set out in Art 19(1)(a) of the EED and requires MS through the NEEAP's to set out which split incentives they have and/or plan to remove. Therefore this issue should be not addressed via the EPBD, or EPBD reviewed against it.
- Eurima welcomes the findings and recommendations in the September 2015 report by the Coalition of Energy Savings on Art 19. This report also outlines in Annex III the MS barriers that were reported in the NEEAPs.
- Eurima also wishes to underline that split incentives can be addressed by a package of solutions consisting of: shared cost approach, forbidding landlords to let properties at very low EE levels (UK), on-bill financing, mandatory energy savings targets, revised rent acts, green leases, improved energy labels and actions to further facilitate ESCO activities (2014 JRC report on overcoming the split incentive barrier in the building sector). As long as proper guidance is given (toolkit) and the barriers are removed, MS should be free to decide which options best suits their local environment.

41. Was

- a) the scaling-up of existing funds sufficient to meet the goals of the EPBD?
- b) the creation of aggregated facilities (through standardisation of Energy Performance Contracts and clarification of regulatory, fiscal and accounting issues)

sufficient to meet the goals of the EPBD?

- No, the scaling up of existing funds to meet the EPBD goals and aggregation facilities are not sufficient to meet the goals of the EPBD. Eurima supports the recommendation in the EEFIG report:
- Stable policy measures and long term financing schemes where « Energy Efficiency First » is the criteria for investments;
- Easy and accessible funding '*one stop shop*' at local level with technical expertise;
- Involvement of building chain actors especially in the banking sector (need for training about multiple benefits of renovation and making renovation financially interesting for lenders);
- Continuation of Financial support through EU funds EFSI (France - Energy Positif), EEEF in France, Kredex in Estonia, JESSICA in Lithuania etc. These require more awareness and uptake of available funds, and projects like EFSI need more aggregators;
- Promote best practices such as the kfW retrofitting, which links quality of works to investment and now also provide cross border lending to i.e. Bulgaria for boosting the energy efficiency of multi-family residential buildings;
- Consider energy efficiency as an infrastructure priority as is already the case in Scotland where

- energy efficiency of buildings is a designated National Infrastructure priority;
- Review European debt and deficit restrictions and accounting rules to create flexibility for public spending on energy efficiency so that energy efficiency investments are less of a debt burden for MS;
- Tackle barriers for a green mortgage market and reduced VAT on works of construction services involving energy efficiency improvements (Such as property taxes to encourage renovation (stamp duty in UK, recent developments in Spain));
- Use of revenues from climate policies such as ETS should be used for investment in deep renovation of the building stock such as the case in Czech Republic;
- Focussing subsidies/grants on renovation projects delivering savings beyond what the market can deliver and bringing the building on the right path to 2050.

Section E - Energy poverty and affordability of housing

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

- 11% of EU population is energy poor; the main reasons being low income, rising energy prices and poorly insulated buildings (Insight E 2015). This report also outlines that energy efficiency measures particularly those focussing on building retrofit are a key part of a strategy to address energy poverty.
- The EPBD review although primarily about energy requirements and performance of the building is an opportunity to address this societal challenge. Hence, structural measures to deeply retrofit the EU building stock by 2050/2030 create not only energy gains but also important societal gains.

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

- There should be a focus on ensuring high quality new build and renovation for all consumers; affordable comfortable, healthy homes should be a fundamental right for all EU citizens.
- The vulnerable group at risk of fuel poverty will benefit the most from reduced energy bills and increased comfort impacting positively their physical and mental health.
- Although energy poverty is not part of the scope of the EPBD, it should not prevent MS from putting in place renovation programmes focused on energy poor/low income households or the development and the promotion of energy-efficiency services and Energy Performance Contracting, specific funds for this purpose - as has been the case in FR, UK and NL.
- Further focus should be helping the social housing sector to deeply renovate their building stock and to make EU funds available for this purpose.

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

- The EPBD review although primarily about energy requirements and performance of the building is an opportunity to address this societal challenge. Hence, structural measures to deeply retrofit the EU building stock by 2050/2030 create not only energy but also important societal gains.
- In the UK and FR (IEA buildings are we on track in Europe 2012), where energy poverty is the highest, projects such as Habiter Mieux (FR) targeting low income households have prioritised building improvements, but there are also projects in Eastern Europe where there is high energy dependence in some cases 100% that have begun addressing their building stock; Solanova in eastern Europe dealing with major renovation, in Hungary and JESSICA in Lithuania.

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

- Energy costs for H&C 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 H&C is included in the rent and is not always made known to the tenant.
- We already know that H&C and cooling accounts for 70% of residential energy consumption across Europe much of this is to do with poor an envelope status. A further EC assessment/mapping of H&C needs across EU and the relation with the housing condition would enable to better target renovation programmes.

Section F - Ensuring new highly efficient buildings using a higher shares of renewable energy

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

- With the ongoing energy transition we can envisage a higher electrification scenario and increase in share of renewables and while there is an influence of building surrounding environment at district and city level for H&C networks, the EPBD's focus should remain at building level and at improving first the intrinsic value of the building, as is the case now.
- What does need to be addressed is the energy consumed in building, and this can be done through optimising H&C energy demand before considering DH or other energy carriers.
- It would be premature to widen the system boundary, without first deploying energy reduction strategies matching the highest potential of existing buildings, and the wider benefits they have for individual and society. A well performing envelope incl. insulation, windows and ventilation equipment's, securing low energy needs for H&C, creates resilience and makes a building future proof no matter how supply side carriers develop. Doing so also avoids oversized equipment, stranded assets and could create huge savings in grid and production capacities (Ecofys, EE and future power system 2015).
- A comprehensive approach, taking into account the wider energy system, starts by an initial focus on increasing the efficiency of buildings; the energy supply system can be optimised from a cost and sustainability point of view by combining demand reduction measures and efficient utilisation of resources. This needs to be done in a comprehensive way linking EED, EPBD and RES. Followed by the necessary demand response measures; viable cost-effective energy efficiency measures facilitate the crucial role of renewables in the sustainable coverage of energy demand.
- As renovation decisions are mostly taken at local level, the active participation of MS/regional and local authority's in reaching our renovation ambition is essential. Local authorities are best placed to raise awareness and support/facilitate easy and accessible energy efficiency projects. (2085)

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?

- To achieve the 2030 target and the goal of a highly efficient building stock, focus needs to be on upgrading the existing building stock to reach an NZEB objective by 2050.
- A requirement for maximum H&C energy demand is currently missing to help reduce the NZEB gaps and ensure the right steps are undertaking for renovation in existing buildings.
- Setting a maximum H&C energy demand (kWh/M²/y) at national level or as EU wide benchmarks will provide important guidance to MS on renovation measures.

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

- All buildings segments are part of the EPBD (public, private, residential, non-residential) are addressed but the new build was prioritised through NZEB. To unleash the full energy savings potential, the existing building stock now needs to be prioritized with a focus to bring them up to NZEB level by 2050.
- It should also be noted that H&C is not a 'sector'; it is a carrier of energy which should be addressed in the EED Art 14.

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?

- The 2018 NZEB target for public buildings and 2020 target for all new buildings have been instrumental in pulling the market towards better energy performance. However, post 2020 a similar target must be set for renovation of our existing building stock, along the same principles so as to ensure that we have a similar driver.

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

- 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.
- - The current EPBD promotes in the NZEB definition 'low energy' and considering renewables

produced on-site or nearby - this already takes into account an evolving energy system. The self-consumption notion for H&C should only kick in once consumption has been lowered to the maximum potential.

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

- The EPBD only deals with the use phase of a building. If other elements are to be addressed it must be part of a holistic evaluation of the whole building using an LCA approach and following the existing CEN standards.

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

- The benefits of an efficient stock to deliver reduced peak demand and enhanced flexibility in the grid should be considered first when considering the role of buildings in the energy system. (see Ecofys 2015 Energy Efficient buildings in the future power system). Efficient building where occupants can disconnect longer from the grid with no side-effect on thermal comfort will enhance the benefits 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?

- The obligation missing at EU and national level is a requirement for maximum H&C energy demand for NZEB and existing buildings combined with a long term vision aiming at a NZEB building stock by 2050, with clear objectives and milestones.

Section G - Links between the EPBD and district and city levels, smart cities, and H&C and cooling networks

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

- Energy planning has a local dimension that needs a strong European framework; it needs an integrated approach and must be in line with EU and national long-term EE and decarbonisation goals.
- The long-term intrinsic quality of buildings and the reduction potential they entails, should not be made dependent on -uncertain - evolution the energy supply system. Indeed there is no technology gap to secure highly performing buildings, starting with their envelope, but technological energy supply choices have not yet been fully developed and are likely to change several times over the lifetime of a building.
- District and city level planning is explicitly addressed in the EED and build on Article 14 (Promotion of efficiency in H&C). Nevertheless, long-term local planning (at city or regional level) must continue to be developed in line with the Energy Efficiency First principle and trias energetica.
- Once H&C energy demand needs are minimized through demand reduction from the building envelope, the opportunities offered by the surrounding environment should be considered.

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?

- The current system boundaries of the EPBD should not be expanded - the external environment and evolving energy system is already fully accounted for in the current scope.
- The EPBD needs to be deepened and not widened so as to address renovation of our inefficient buildings. Setting a benchmark for the maximum H&C energy demand (defined nationally) and with an EU level benchmark inspired by the Passive house definition of 15kWh/m²/year for heating and similar for cooling) will help increase energy efficiency of the building having a long term quality in mind, trigger energy renovations, save large investments in supply system, prevent overreliance on developing new technologies, help us be independent from supply carriers and avoid having stranded assets.
- The same rationale should apply to the EPC itself, a tool meant to make the energy performance of a building visible and encourage renovation.

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

- No response.

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 have specific provisions such as those for electric meters needed?

- Better energy management through digital and telecommunication technologies are part of smart cities and smart buildings. However, when developing initiatives linked to smart cities such as the Smart Cities Initiative (SCI), primary focus should be on exploiting the unique efficiency potential of buildings for ensuring a resilient and comfortable building stock. It should build on the current legislative framework (EPBD, EED) to ensure synergies and not discourage investment in other important areas such as building renovation.
- In addition, energy prices vary according to supply and demand - this is another reason to maintain the EPBD at system boundary level, reducing energy consumption will not only create less dependency but also less risk of fluctuating prices.

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?

- See response Q54 and Q57.

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

- District H&C is conditioned by the area, population density, competing distribution systems (gas), available fuel and access to grid connection. Sustainable long term supply solution, including when it comes to district H&C solutions, should be consistent with the evolution of demand, and for building in particular, a long term strategy for renovating our existing stock to NZEB level by 2050. This way we ensure to first reduce the H&C energy needs, before considering supply options (whichever they may be) in order to avoid overinvestment.

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

- It should be noted that DH should be considered alongside any other energy supply carrier, once the demand reduction of the building has been optimised. The EPBD should avoid inadvertently picking winners when it comes to supply side options.
- The external environment and evolving energy system is already fully accounted for in the current scope and therefore the EPBD focus should remain on reducing the energy consumption of the building.

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

- Eurima understands that the Commission is currently undertaking a study on cost optimal performance requirements and would welcome these insights.

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?

- As mentioned in questions above, the EPBD needs to be deepened and not widened so as to address renovation of our inefficient buildings in the most cost efficient way safeguarding the long term qualities of the building envelope. Setting a maximum H&C energy demand (defined nationally and/or an EU benchmark) will help increase energy efficiency of the building, trigger energy renovations, save large investments in supply system, prevent overreliance on developing technologies, help us be independent from supply carriers and avoid having stranded assets.

Section H - Awareness, information and building data

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? 2. national authorities 3. regional authorities? 4. local authorities? 5. local companies?

- The EC is regularly compiling data on the energy consumption, the H2020 and EPBD Concerted Action has been set-up to study the implementation and now the creation of a building stock observatory - will inform and provide insights for more targeted and better communications vis-à-vis MS and the construction value chain. That said, currently most of the information by the EC as regards EE concerns EE of demand response/appliances/labelling or use of alternative energy sources - but is less focussed on building performance, improvements and their respective benefits for different segments.
- It is also not clear whether as stipulated in Art 20 that MS have in fact taken '*necessary measures to inform owners/tenants of the methods and practices to improve energy performance*'. National authorities need an EU wide regulatory signal to trigger real change, since the intensity/level of information on EE is steered by how high (or low) importance MS give to EE policies in the context of their national own climate and energy plans. More can be done at MS/regional/local authority level (City of Essen approved a 3% annual renovation rate for social housing) to inform business and consumers about home improvements and funding.
- Most building owners/consumers are still not aware of the range of multiple benefits (e.g. jobs, health, comfort, productivity, health, lower bills) that improved energy performance of buildings could bring - and even if they would not know where/how to obtain the necessary financing. Therefore, doing more on awareness-raising led by MS/regional and local authorities could help increasing consumer awareness and confidence and broadening the social support for an ambitious policy in this area. If public announcements can be made for reducing the level of cars on the road and to take the train, similar announcements should be done for improving homes, and enjoying lower bills and the benefit of asset value increase.
- To ensure coherence, these awareness campaigns should be part of the framework of the long-term national renovation strategies (EED Article 4) and the renovation roadmap should be timed and made mandatory. (2175)

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

- No response.

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?

- The EPBD Concerted Action, the Eurostat, Enerdata and the EU building stock observatory (in the making) are important repositories for building data.
- As targeting renovation should be the next big objective of the EPBD, it is important to have more information about renovation for different segments, best practices etc.

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?

- This should be done by a national building institute. If you want to convince residential building owners it has to be explained with simple data - this can be done through a building passport.
- Enabling all buildings to be equipped with an EPC, and such EPCs should develop into renovation roadmaps supported by an IT platform, would enable to better track the energy status as well as the amount of works planned.

67. Has building data harmonisation been achieved?

- Building data harmonisation is already not fully in place in MS; therefore it is unlikely that this has been achieved at EU level. In this context the EU building repository and EPC database is a very good initiative.

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

- EPC database is important but first needs better quality and comparable EPCs.
- To ensure consistency, given that the EPBD should remain focussed on the current system

boundaries (performance of the building), EPCs themselves should remain focussed on the performance of the building, as a tool meant to make the energy performance of a building visible and encourage renovation.

- See responses to Q10, Q22, Q27, Q30 and Q33.

Section I: Sustainability, competitiveness and skills in the construction sector

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

- Onsite inspections and high quality skilled/trained workforce of which there is a lack of (inter alia, authorities/local/regional, business and home owners, economists, architects, construction workers etc.) with continuous training is essential for ensuring quality of the works and is what compliance systems depend on.
- See responses to Q2, Q22, Q24 and Q25.

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

- 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.

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

- Materials, waste and water are not addressed in the EPBD but rather in EU waste legislation, inter alia, PPWD, WFD, PEF etc. this should remain this way.

Section J: Building systems requirements

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

- Similar to a minimum requirement for the H&C energy demand in buildings it would be useful introduce minimum performance requirements (at national level) for technical building systems.

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?

- Similar to a minimum requirement for the H&C energy demand in buildings it would be useful introduce minimum performance requirements (at national level) for technical building systems.

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?
- b. that owners/occupiers are properly informed about the potential improvements to the efficiency of their systems?
- c. that replacement/upgrading of the technical building systems is triggered?

- (a) Inspections for buildings and technical equipment are important to ensure proper performance during the lifetime of the system and avoid unnecessary losses.

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?

- No response.

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?

- Building elements are made of different construction products, which have to be compatible with

the Construction Products Regulation and the Ecodesign Directive (EU legislation) and the EPBD.

- In principle there should not be any market barrier(s), since building elements are made of products themselves which are regulated at EU level.

Section K: Operational management and maintenance

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

- 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.
- Ensuring consistency between design and operational efficiency must start with ensuring that the building is “built” as designed by introducing mandatory on-site inspections during the construction phase. As buildings become more energy efficient an increased resolution/detail is required such as the PHPP (passive house planning package). In parallel, a more focussed approach to the measurement and oversight of thermal bridging and airtightness should be promoted.

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

- See response Q72 and Q73

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

- No response.

80. Further comments

- No further comments.

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