

# Public consultation on the Energy Performance of Buildings Directive



This consultation forms part of the evaluation of the [Energy Performance of Buildings Directive](#). Under the terms of the Directive, the Commission is required to carry out this evaluation by 1 January 2017, with assistance from a Committee of Member States' representatives. The evaluation should reflect the experience gained and progress made since the adoption of the Directive. If necessary, the Commission should make proposals on the basis of the evaluation.

The evaluation also follows on from the *Energy Efficiency Communication* of July 2014, which indicated that additional measures to be introduced to improve energy efficiency would need to primarily address the energy efficiency of buildings and products if progress is to be made by 2030. The Energy Performance of Buildings Directive is the main legislative instrument in force at EU level covering the energy efficiency of buildings.

[The Energy Union](#), launched in February 2015 as one of the EU's ten priority areas for action, has five mutually reinforcing and closely interrelated areas of focus, one of which is 'Energy efficiency contributing to a moderation of demand'. The Energy Union strategy identifies improvements to energy efficiency in the building sector as a change that could make a critical contribution to the Commission's energy and climate strategy. Action will be needed from Member States in order to exploit the energy efficiency potential of existing buildings. As part of the Energy Union, the Commission will also look to simplify access to existing funding, as EU funds and financing from the European Investment Bank can make a significant difference for Member States.

Measures relating to energy efficiency and the use of renewable energy form part of broader initiatives designed to ensure that the EU meets the objectives of its energy and climate change policy. The EU's policy on energy efficiency and renewable energy also stimulates economic recovery and promotes growth and the creation and retention of jobs. It is thus important for the competitiveness of the construction sector, and forms an integral part of the EU's long-term vision for smart, sustainable and inclusive growth, set out in the Europe 2020 Strategy and promoted through the European Semester process. Energy efficiency has been incorporated into a number of the EU's main policies, such as the Structural and Innovation Funds. The energy efficiency of buildings features particularly strongly. Information and communication technologies (ICT) are also contributing to the improvement of energy efficiency and the reduction of total energy use in buildings, including houses, offices, public buildings and spaces, making city centres and residential areas more efficient and more attractive places to live, work and do business. Reducing energy use also reduces the amount of carbon dioxide emitted into the atmosphere, thus helping to tackle one of the major causes of climate change.

The Energy Performance of Buildings Directive requires Member States to set energy performance standards for buildings, to issue buildings with energy performance certificates and to ensure that, by the end of 2020, all new buildings are 'nearly zero energy' buildings. The Directive introduced a benchmarking system, the aim of which is to create an incentive for making the energy performance requirements set by national or regional building codes more ambitious, and to ensure that these requirements are reviewed regularly. Member States were required to have most of the measures set out under the Directive in force by January 2013. It has been estimated that the Directive will reduce the EU's total energy consumption [by 5-6% by 2020](#).

By managing energy demand, the EU can influence the global energy market and hence the security of energy supply. The Energy Roadmap 2050 (COM (2011) 885 final) shows that improved energy efficiency in new and existing buildings will be critical to managing energy demand over the period 2020-2050. Nearly zero energy buildings should become the norm. Buildings could even produce more energy than they use. Smart technologies such as home automation will give consumers greater influence over their own consumption patterns, and individual buildings and districts will play an active role in local distribution and storage grids.

Although there has been investment in energy efficiency and use of renewable energy in buildings for some decades, the level of investment has not been sufficient. Investment in this area has become strategically important for the EU as a result of the high level of energy imports (the EU imported 55% of the energy used in 2012, at a cost of EUR 400 bn), volatile energy prices, and for reaching the EU target for 2030 of cutting greenhouse gas emissions by at least 40% compared with 1990 (which includes the target of a 30% reduction of greenhouse gases in non-ETS sectors). A number of the policies and markets that are central to shaping investment in energy efficiency and on-site renewable energy are still relatively new, and it will take time for their full effect to be felt. As highlighted in the report of the Energy Efficiency Financial Institutions Group ([EEFIG Report](#)) on investment in energy efficiency in buildings, the policy framework should encourage businesses to invest in energy efficiency at the critical points in their investment cycle, using a 'carrot and stick' approach. Reporting, accounting and procurement procedures must facilitate, and not hinder, appropriate investment in energy efficiency in public buildings while also clarifying the regulatory, fiscal and accounting treatment and standardising Energy Performance Contracts.

The Commission plans to bring forward its assessment of the issues discussed above to meet the deadline for evaluation of the Energy Performance of Buildings Directive. Addressing these issues is all the more important given the contribution made by buildings both to achieving EU objectives for energy and climate policy and growth, and to improving living standards and reducing energy bills for EU citizens. This consultation exercise will provide an important source of information for the assessment, and will help to ensure that the analysis is robust and comprehensive. This consultation will also serve as a framework for potential further consultation on specific topics such as district energy, retail, building automation and monitoring, building regulations and financing.

*This consultation is designed to allow respondents to answer the questions that are relevant to them, their knowledge and experience, and/or their concerns. Respondents are not required to answer all questions. There are twelve sections.*

*The questions are in English; the Commission services invite respondents to answer in any official EU language.*

## INFORMATION ABOUT YOU

Are you responding to this questionnaire on behalf of/as: <sup>\*</sup> (compulsory)

- an individual
- an organisation
- a company
- a public authority
- other

What is the name of your company/organisation? <sup>\*</sup> (compulsory) (maximum 50 characters; count: 0)

Which country or countries are you from/most active in? <sup>\*</sup> (compulsory)

- |                                      |                                   |                                      |
|--------------------------------------|-----------------------------------|--------------------------------------|
| <input type="radio"/> Austria        | <input type="radio"/> Belgium     | <input type="radio"/> Bulgaria       |
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| <input type="radio"/> Denmark        | <input type="radio"/> Estonia     | <input type="radio"/> Finland        |
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| <input type="radio"/> United Kingdom | <input type="radio"/> Other       |                                      |

Can we publish your answers on the Commission website? <sup>\*</sup> (compulsory)

- YES – under my name (I consent to all of my answers/personal data being published under my name and I declare that none of the information I have provided is subject to copyright restrictions).

- YES – **anonymously** (I consent to all of my answers/personal data being published anonymously and I declare that none of the information I have provided is subject to copyright restrictions).
- NO – **please keep my answers confidential** (my answers/personal data will not be published, but will be used internally within the Commission).

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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 CO<sub>2</sub> 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 on its goals?
2. Has it helped improve energy efficiency in buildings?
3. Has it helped to increase renovation (more than 25% of the surface of the building envelope) rates?
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?
5. Overall, do you think that the EPBD is contributing to cost-effective improvements of energy performance? Why/Why not?
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?
7. Has the EPBD effectively addressed the challenges of existing buildings' energy performance?
8. Has the EPBD set effective energy performance standards for new buildings?
9. Will the 'nearly zero energy buildings' targets be met? Why/Why not?
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?
11. What has worked well in the EPBD? What needs to be improved?
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)?

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?
14. Are the objectives of the EPBD delivered efficiently?
15. Has the EPBD created any unnecessary administrative burdens? If so, please provide examples
16. Has the EPBD created any unnecessary regulatory burdens? If so, please provide examples

## **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 m<sup>2</sup> 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?
18. Is the definition of NZEBs in the EPBD sufficiently clear?
19. Is the NZEB target in the EPBD sufficiently clear to be met?
20. If not, what, in your view, are the missing factors that would ensure compliance with:
  - a. Minimum energy performance requirements in new buildings?
  - b. Minimum energy performance in major renovations of existing buildings?
  - 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.)?
  - d. Minimum renewable energy requirements to meet the NZEB target by 2020?



- e. Certification of the energy performance of buildings, including tailor-made recommendations for the improvement of the energy performance of buildings?
  - f. Regular inspections of heating and air-conditioning systems?
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?
  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?
  23. What do you think of the various ways of calculating building energy performance at national/regional level? Please include examples.
  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?

### **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?
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?
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?
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?
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?
30. Are EPCs designed in a way that makes it easy to compare and harmonise them across EU Member States?
31. Do you think that the 'staged deep renovation' concept is clear enough in the EPBD?
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?
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?

## D. Smart Finance for Smart Buildings: 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?
35. What non-financing barriers are there that hinder investments, and how can they be overcome?
36. What are the best financing tools the EU could offer to help citizens and Member States facilitate deep renovations?
37. What role do current national subsidies for fossil fuels have in supporting energy efficient buildings?
38. Have energy efficiency and renewable energy projects been combined to maximise their financing? How can the EU help?
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?
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?
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?

## **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 ideally should not 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?

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

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

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

## **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?
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?
48. Which building sectors have been addressed as a priority (public/private, residential/non-residential, industry, heating & cooling)?
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?
50. Has the EPBD framework improved the self-consumption of electricity in buildings?
51. Does the EPBD address the issue of embedded energy? If so, in what way?
52. Is demand response being stimulated at the individual building level and if so, how?
53. What obligations are missing at EU level and national level, and at regional and local level to meet the goals of the EPBD?

## **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?
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?
56. How has the information exchange on smart technologies which contribute to compliance of the EPBD, been promoted in cities?
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?
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?
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?
60. What incentives are missing, that would help promote efficient district heating and cooling or meeting the goals 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?
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?

## 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?
  2. national authorities?
  3. regional authorities?
  4. local authorities?
  5. local companies?
64. Has the directive promoted information on opportunities for consumer-friendly smart meters and interoperable energy efficient appliances?
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?
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?
67. Has building data harmonisation been achieved?
68. Is there a need for a central EU database of EPCs and qualified experts?



## **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?
70. Would it have been useful to extend Eurocodes to include energy performance in buildings and other relevant aspects? If so, why?
71. Are energy, materials, waste and water use addressed in the EPBD?

## 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?
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?
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?
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?
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?

## **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?
78. Based on existing experience, does the EPBD promote the best way to close the gap between designed and actual energy performance of buildings?
79. Based on existing experience, are the provisions provided by the EPBD to stimulate a proactive, innovative maintenance market effective?

L. Further comments (optional) (maximum 1000 characters; count: 0)

**SUBMIT**