Article 2a

Long-term Renovation Strategies

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1. INTRODUCTION

Article 1 of **Directive (EU) 2018/844 amending Directive 2010/31/EU on the energy performance of buildings**[1] introduces a new provision, Article 2a, related to long-term renovation strategies (hereafter referred to as "LTRS") into Directive 2010/31/EU[2] (hereafter also "the revised EPBD" or "the revised Directive"), replacing Article 4 of Directive 2012/27/EU on energy efficiency[3] (hereafter referred to as "the EED").

The revised Directive includes a stronger reference to energy poverty, inclusion of references to health, safety and air quality, initiatives to promote smart technologies, skills and education, policies targeting the worst performing segments of national building stocks, to split-incentive dilemmas, market failures and public buildings.

Strong LTRS are expected to accelerate the cost-effective renovation of existing buildings which currently display a low renovation rate. The strategy is not an end in itself, but a starting point for reinforced action.

The aim of this guidance document is to clarify the provisions of the new Article 2a on LTRS and to support correct implementation in the national/regional regulatory framework. The note states the views of the Commission services, does not alter the legal effects of the Directive and is without prejudice to the binding interpretation of Article 2a as provided by the Court of Justice.

[1] Directive (EU) 2018/844 of 30 May 2018 amending Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency.

[2] Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings.

[3] Directive 2012/27/EU of the European Parliament and of the Council of of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC.

2. SCOPE

Article 4 of the EED, which has now been repealed by way of Directive (EU) 2018/844 already provided that Member States must establish a long-term strategy for mobilising investment in the renovation of the national stock of residential and commercial buildings, both public and private.

Under the revised EPBD, Member States' strategies must still cover the national stock of residential and non-residential buildings, both public and private, as under Article 4 of the EED. However, the revised EPBD introduces new and broader obligations and defines wholly new areas of policy and action which should be included in LTRS,

Under the new Article 2a of the revised EPBD, Member States are required to:

1. Establish a comprehensive strategy aimed at achieving a highly efficient and decarbonised building stock by 2050 and cost-effective transformation of existing buildings into nearly zero-energy buildings;
2. Set out a roadmap with measures, measurable progress indicators and indicative milestones for 2030, 2040 and 2050;
3. Carry out a public consultation on their strategy prior to submission to the Commission and define modalities for further and inclusive consultation during implementation;
4. Facilitate access to mechanisms through smart financing to support the mobilisation of investments;
5. Submit their strategy as part of their final integrated national energy and climate plan and provide information about implementation in their integrated national energy and climate progress reports.

3. OBLIGATION TO ESTABLISH A COMPREHENSIVE STRATEGY TO ACHIEVE A HIGHLY DECARBONISED BUILDING STOCK BY 2050

3.1. Mandatory elements of the LTRS

Member States' LTRS will cover "existing" elements (which were set out under Article 4 of the EED) and new elements (as defined in the revised EPBD, Article 2a). Each LTRS must now encompass the elements below.

3.1.1. Overview of the national building stock (Article 2a(1)(a))

Article 4(a) of the EED already provided that the starting point of LTRS was an overview of the national building stock.

Article 2a(1)(a) of the revised EPBD provides that LTRS must encompass:

> "an overview of the national building stock, based, as appropriate, on statistical sampling ***and expected share of renovated buildings in 2020****;*"

In addition to requirements which already existed under Article 4(a) EED, Member States will now have to include the expected share of renovated buildings in 2020 in their overview of the national building stock (see above in bold italics).

The expected share of renovated buildings may be expressed in different ways such as:

- percentage (%)
- absolute number
- m^2 of renovated space per type of building.

Renovation depth could also be used to better describe the nature of renovated buildings, such as "light," "medium" and "deep". Transformation into nearly zero-energy buildings (NZEB) could be another indicator.[4]

"Expected share" is not intended as a binding target but rather as a figure that realistically represents the likely rate of completed building renovation in 2020. Member States can also mention the expected share of completed renovation for 2030, 2040 and 2050, in line with the requirement to provide indicative milestones for these years.

3.1.2. Cost effective approaches to renovation (Article 2a(1)(b))

Article 4(b) of the EED already provided that LTRS must identify cost-effective approaches to renovation relevant to building type and climatic zone.

[4] The following renovation depths, have been developed in the context of the EU Building Stock Observatory, based on primary energy savings: light renovations (less than 30%); medium renovations (between 30% and 60%); deep renovations (beyond 60%). NZEB renovations are not defined in terms of a specific primary energy saving threshold, but according to official national NZEB renovation definitions.

Article 2a(1)(b) of the revised EPBD provides that LTRS must encompass:

> the identification of cost-effective approaches to renovation relevant to the building type and climatic zone, ***considering potential relevant trigger points, where applicable, in the life-cycle of the building;***

Therefore, in addition to requirements which already existed under Article 4(b) EED, Member States will now have to consider potential trigger points in the life cycle of the building (see above in bold italics).

Recital 12 of Directive (EU) 2018/844 clarifies the concept of "**trigger point**" as "*an opportune moment in the life cycle of a building, for example from a cost-effectiveness or disruption perspective, for carrying out energy efficiency renovations*".

A trigger point could be a:

- Transaction (e.g. the moment of sale, rental[5] or lease of a building, its refinancing, or a change of use of a building)
- Renovation (e.g. an already-planned wider non-energy related renovation);[6]
- Disaster/Incident (e.g. fire, earthquake, flood).[7]

Certain buildings may not be subject to trigger points and this is why the provision includes the qualification "where applicable."

Linking energy-efficiency renovation with trigger points would ensure that energy-related measures are not neglected or omitted at a later stage in the life-cycle of the building. By focusing on energy efficiency when trigger points are reached, the risk of losing the opportunity to renovate in the future can be avoided and possible synergies with other actions best exploited.

Trigger points may in particular lead to cost-effective renovation due to economies of scale which can be achieved in carrying out energy-related renovation measures simultaneously with other necessary works or already-planned renovations.

3.1.3. Policies and actions towards deep renovation (Article 2a(1)(c))

Article 4(c) of the EED already provided that LTRS must encompass policies and actions to stimulate cost-effective deep renovation of buildings, including staged deep renovation.

[5] Recital 9 of Directive (EU) 2018/844 encourages Member States to consider introducing or continuing to apply requirements for a certain level of energy performance for rental properties, in accordance with Energy Performance Certificates (EPCs). This type of measure, which would go beyond the requirements of the revised EPBD, would introduce a requirement to renovate worst performing buildings before they are rented.

[6] Such renovations could include for example those related to improving accessibility for people with reduced mobility.

[7] Member States could explore the possibility of incentivising insurance companies to inform clients of financing instruments available in the Member State (thereby also reducing their costs following a natural disaster/accident).

Article 2a(1)(c) of the revised EPBD provides that LTRS must encompass:

> policies and actions to stimulate cost-effective deep renovation of buildings, including staged deep renovation, ***and to support targeted cost-effective measures and renovation for example by introducing an optional scheme for building renovation passports;***

Deep renovations are those which lead to a refurbishment that reduces both the delivered and final energy consumption of a building by a significant percentage compared with the pre-renovation levels leading to a very high energy performance.[8] According to the Commission Staff Working Document accompanying the 2013 Commission report on financial support for energy efficiency in buildings,[9] "deep renovation" can be considered to mean a renovation which leads to significant (typically more than 60%) efficiency improvements.

The concept of "**building renovation passport**" is introduced in the revised EPBD as an example of a measure Member States can use to support targeted cost-effective renovation and staged deep renovation. "Building renovation passport" is not defined in the EPBD. A certain number of common elements have been identified as constituting a building renovation passport (BRP):[10] a document - in electronic or paper format – outlining a long-term (up to 15 or 20 years) step-by-step renovation roadmap for a specific building resulting from an on-site energy audit fulfilling specific quality criteria and outlining relevant measures and renovations that could improve the energy performance of a building.[11]

3.1.4. Policies and actions towards worst-performing buildings and energy poverty (Article 2a(1)(d))

Article 2a(1)(d) of the revised EPBD provides that LTRS must encompass:

> ***an overview of policies and actions to target the worst performing segments of the national building stock, split-incentive dilemmas, and market failures, and an outline of relevant national actions that contribute to the alleviation of energy poverty;***

[8] Recital 16 of the EED

[9] Commission Staff Working Document (SWD(2013) 143 final) accompanying the report from the Commission to the European Parliament on "Financial support for energy efficiency in buildings" COM(2013)225 final.

[10] See 2016 report from Buildings Performance Institute Europe - http://bpie.eu/wp-content/uploads/2017/01/Building-Passport-Report_2nd-edition.pdf

[11] According to Article 19a of the revised EPBD, the Commission shall, before 2020, conclude a feasibility study, clarifying the possibilities and timeline to introduce an **optional** building renovation passport that is complementary to the energy performance certificates, in order to provide a long-term, step-by-step renovation roadmap for a specific building based on quality criteria, following an energy audit, and outlining relevant measures and renovations that could improve the energy performance. This study will provide an in-depth overview of existing building renovation passport schemes already in place.

This is a new element which did not exist under Article 4 EED. Member States' LTRS will now have to give an overview of policies and actions that target:

- worst performing segments of the national building stock;
- split incentive dilemmas;
- market failures;
- alleviation of energy poverty.

The overview should encompass at least a short description of each policy and action, its scope and duration, the allocated budget and the expected impact.

Member States are to determine the **worst performing segments** of their national building stock. This could be done for example by setting a specific threshold, such as an Energy Performance Category (e.g. below "D"), a primary energy consumption figure (expessed in kwh/m^2 per year), or even buildings built before a specific date (e.g. before 1980).

'Split incentive' between the owner and the tenant of a building or among owners refers to a situation the party who pays for energy retrofits or efficiency upgrades cannot recover the full benefits and savings.[12] Member States are encouraged to consult the report "Overcoming the split incentive barrier in the building sector" developed by JRC in 2014.[13]

Mention of "**market failures**" in the revised EPBD is not new. Article 10 of the EPBD already identified **market barriers and failures** towards energy renovation as an area of focus and Recital 20 of the EPBD also referred to measures that aim to reduce existing legal and market barriers.

Mention of "**energy poverty**" in the revised EPBD is not new. The EED includes references to both "energy poverty" (Article 7 and Recital 53) and "fuel poverty" (Recital 49). Energy poverty is a result of a combination of low income, high energy expenditure and poor energy performance of dwellings, which is why effective action to alleviate energy poverty should include energy efficiency measures alongside social policy measures. While several Member States already have addressed energy poverty within their LTRS, the revised EPBD now requires that national actions that contribute to the alleviation of energy poverty should be outlined in LTRS.[14]

[12] Article 19 of the EED already requires Member States to "evaluate and if necessary take appropriate measures to remove regulatory and non-regulatory barriers to energy efficiency, without prejudice to the basic principles of the property and tenancy law of the Member States. In particular as regards the split of incentives between the owner and the tenant of a building or among owners, with a view to ensuring that these parties are not deterred from making efficiency- improving investments that they would otherwise have made by the fact that they will not individually obtain the full benefits or by the absence of rules for dividing the costs and benefits between them, including national rules and measures regulating decision-making processes in multi-owner properties."

[13] https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/overcoming-split-incentive-barrier-building-sector

[14] Under Article 3 of the political agreement on the Governance Regulation, when a Member State finds that it has a significant number of households in energy poverty, it must include in its NECP a national indicative

The revised provision, together with the Recital 11 of Directive (EU) 2018/844, provides sufficient flexibility for Member States to implement the legislation according to their national context without interfering with Member States' competencies on social policy.[15]

3.1.5. Policies and actions towards public buildings (Article 2a(1)(e))

Article 2a(1)(e) of the revised EPBD provides that LTRS must encompass:

policies and actions to target all public buildings;

Certain public buildings were already included in the scope of LTRS under Article 4 of the EED. However, Article 2a of the revised EPBD now requires LTRS to include specific policies and actions which target all public buildings. This should include ongoing initiatives undertaken by Member States to fulfil their obligations under the EPBD and the EED. [16]

Both the EED and the EPBD include provisions which oblige public authorities to lead by example by becoming early adopters of energy efficiency improvements, notably under Articles 5 and 6 of the EED which apply to public bodies' buildings.

However, point (1)(e) of Article 2a is broader in scope than Articles 5 and 6 of the EED given that it concerns all "public buildings" and not just "public bodies' buildings"[17] which are owned and occupied by central government. Policies and actions under point (1)(e) of Article 2a of the EPBD should also include, for example, buildings which are occupied (e.g. leased or rented) by local or regional authorities as well as buildings which are owned by central government and regional and local authorities, but not necessarily occupied by them.

Article 2a of the EPBD does not exempt any type of military building from the scope of the LTRS.[18]

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objective to reduce energy poverty and measures to address it, as well as to report on progress in the context of its annual reports.

[15] Recital 11 of of Directive (EU) 2018/844 explicitly mentions that "the need to alleviate energy poverty should be taken into account, in accordance with criteria defined by the Member States. While outlining national actions that contribute to the alleviation of energy poverty in their renovation strategies, the Member States have the right to establish what they consider to be relevant actions."

[16] Under Articles 5 and 6 of the EED, Member States already have existing obligations related to buildings owned and occupied by central government and to procurement of buildings by central government.

17 "Public bodies' buildings" is defined in Article 2(8) of the EED as "'contracting authorities' as defined in Directive 2004/18/EC on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts.

[18] However, Article 5(2)b of the EED allows Member States not to apply the requirements referred to in paragraph 1 of the Article to "buildings owned by the armed forces or central government and serving national defence purposes apart from single living quarters or office buildings for the armed forces and other staff employed by national defence authorities." Therefore, military buildings (offices, barracks, hospitals, academies) falling in the above-mentioned categories are subject to the obligations in Article 5 of the EED. As these buildings are technically and functionally identical to civilian buildings, their energy efficiency improvements can give a significant contribution to the achievement of national objectives.

Financial mechanisms and incentives should promote investments by public authorities in an energy efficient building stock, for example by way of public-private partnerships or optional energy performance contracts[19] in line with Eurostat accounting rules and guidance.[20]

3.1.6. Incentives towards smart technologies and skills – (Article 2a(1)(f))

One of the objectives of the revised EPBD is to modernise the Directive in light of technological developments such as smart building technologies and to facilitate the uptake of electric vehicles and other technologies both through specific installation requirements and by ensuring that building professionals can deliver the appropriate skills and know-how to deploy new technologies.

Article 2a(1)(f) of the revised EPBD provides that LTRS must encompass:

> ***an overview of national initiatives to promote smart technologies and well-connected buildings and communities, as well as skills and education in the construction and energy efficiency sectors;***

This is a new element of LTRS which did not exist under Article 4 EED. Member States' LTRS will now need to give an overview of national initiatives that promote

- smart technologies and well-connected buildings and communities;
- skills and education in the construction and energy efficiency sectors.

The overview should encompass at least a short description of each initiative, its scope and duration, the allocated budget and the expected impact.

Smartness in buildings is an essential element in a decarbonised, renewable-intensive and more dynamic energy system in Europe with the aim of reaching the 2030 EU targets on energy efficiency and renewable energy, and of achieving a decarbonised EU building stock by 2050. LTRS must describe the national initiatives on the smart technologies and well-connected buildings and communities that may, for example, aim to:

- Achieve high energy efficiency by optimal operation of the building and facilitate the maintenance of technical building systems;
- Strengthen the role of demand side flexibility for increasing the share of renewables in the energy system and making sure that the benefits are cascaded down to the consumers;
- Ensure that the building user's needs are covered and they can effectively interact with the building;

[19] Recital 16 of Directive (EU) 2018/844

[20] In May 2018, Eurostat and the European Investment Bank launched their new practitioners' guide on the statistical treatment of Energy Performance Contracts. It will help public authorities and market actors understand under which conditions of an Energy Performance Contract could be considered off balance sheet. It will help public authorities prepare and finance projects by mobilising private capital and expertise.

- Contribute to the establishment of well-connected buildings and smart communities.

Member States may consider adopting measures which encourage the deployment of recharging points and ducting infrastructure for electric vehicles in the context of building renovation projects even if the renovation is not considered to be a "major renovation" within the meaning of Article 2, paragraph 10 of the revised EPBD.

The **training of energy experts** is essential in ensuring the transfer of knowledge on issues related to EPBD implementation. Within the framework of Article 17, Member States must already ensure that energy performance certification of buildings and inspection of heating and air-conditioning systems are carried out in an independent manner by qualified and/or accredited experts. LTRS should present an overview of national intiatives promoting the necessary skills of building professionals in the application of new techniques and technologies in the field of NZEB and energy renovation. As part of national educational policy, energy efficiency should be incorporated into programmes for professionals in the construction sector (for example, engineers, architects).

3.1.7. Estimation of energy savings and wider benefits (Article 2a(1)(g))

Article 4(e) of the EED already provided that LTRS must provide an evidence-based estimate of expected energy savings and wider benefits.

Article 2a(1)(g) of the revised EPBD provides that LTRS must encompass:

> an evidence-based estimate of expected energy savings and wider benefit***s, such as those related to health, safety and air quality;***

The new provision provides a non-exhaustive clarification on the type of wider benefits that Member States' LTRS should evaluate.

Certain measures to address energy performance can also contribute to achieving a healthy indoor environment. Measures should aim to prevent illegal removal of harmful substances and facilite compliance with legislation relating to working conditions, health and safety, and emissions,[21] as well as facilitate higher comfort levels and well-being for occupants notably by ensuring complete and homogenous insulation,[22] coupled with the appropriate installation and adjustment of technical building systems, in particular heating and air-conditioning, ventilation and building automation and control.

[21] Recital 14 of Directive (EU) 2018/844

[22] See reference to 2009 World Health Organisation guidelines in Recital 13 of Directive (EU) 2018/844.

Wider benefits may also include avoided illness and health costs, increased labour productivity from better working conditions and improved living conditions, increased employment in the building sector and reduced emissions.

The evaluation of potential wider benefits associated with energy-efficiency measures, may enable a more holistic and integrated approach at national level, highlighting synergies with other policy areas that can be achieved and ideally involving government departments other than energy or buildings such as the health, environment, finance or infrastructure departments.

In their evidence-based estimate of benefits relating to health, safety and air quality, Member States may also include the effects from actions they take under Article 7 paragraph 5 of the revised EPBD. That article requires them to address healthy indoor climate conditions as well as fire safety and risks related to intense seismic activity in the case of buildings undergoing major renovation. In addition, Member States may also include in their estimate the effects of actions they may have taken under Article 2a(7) of the revised EPBD, which refers to fire safety and risks related to intense seismic activity.

Renovation can be conducted is such a way that when, in the future, the building reaches its end of life, or will go through another major renovation, different construction products or materials can be separated from each other. This is turn allows for reuse or recycling, which can substantially reduce demolition waste being landfilled. This future possibility for circularity depends directly on how renovation is conducted, which materials are chosen and how they are assembled. Recycling of materials can have a positive impact on energy consumption, as manufacturing primary construction products normally requires more energy than using secondary ones.

3.2. Set out a roadmap (Article 2a(2))

Article 2a(2) of the revised EPBD provides that LTRS must include a roadmap which is comprised of measurable progress indicators and milestones:

> ***In its long-term renovation strategy, each Member State shall set out a roadmap with measures and domestically established measurable progress indicators, with a view to the long-term 2050 goal of reducing greenhouse gas emissions in the Union by 80-95 % compared to 1990, in order to ensure a highly energy efficient and decarbonised national building stock and in order to facilitate the cost-effective transformation of existing buildings into nearly-zero-energy buildings. The roadmap shall include indicative milestones for 2030, 2040 and 2050, and specify how they contribute to achieving the Union's energy efficiency targets in accordance with Directive 2012/27/EU.***

This is a new element of LTRS which did not exist under Article 4 EED.

Underpinning the roadmap is the objective of achieving a highly energy efficient and fully decarbonised building stock –essential to delivering on the EU goal of reducing greenhouse gas emissions. A decarbonised building stock is not defined in EU legislation but can be considered as a building stock whose carbon emissions have been reduced to zero, both through reducing energy needs and by ensuring that remaining energy needs are met to the extent possible from zero-carbon sources. This approach allows various routes to decarbonisation, taking into account the national energy mix, preferences, potential and characteristics of each Member State.

As the strategies aim at having a "long-term" vision, Member States should go beyond a simple inventory of existing measures and should provide a long-term vision on the evolution of future policies and measures. The roadmap framework in the new Article 2a seeks to achieve this.

Roadmaps must be comprised of **measurable progress indicators and indicative milestones**.

Indicators can be quantitative or qualitative variables to measure progress towards achieving a goal. Under Article 2a(2) of the revised EPBD, Member States should set measurable progress indicators with a view to the long-term 2050 goals of reducing greenhouse gas emissions in the Union and ensuring a highly energy efficient and decarbonised national building stock. These indicators can be revised if necessary and are intended to facilitate the assessment of progress towards the goal of reducing greenhouse gas emissions and achieving a highly energy efficient and decarbonised national building stock.

Milestones can be quantitative or qualitative goals. Under Article 2a(2) of the revised EPBD, Member States must set **indicative milestones** for 2030, 2040 and 2050 and specify how they will contribute to achieving the Union's energy efficiency targets under the EED. Member States can tailor their milestones and indicators to the specificities of their Member State. The intention is not to introduce a sectoral target for the building sector, nor to establish legally binding targets It is for Member States to define the specific milestones and to decide whether to make such goals binding for the building sector (thus going beyond obligations in the revised Directive). However, Member States should keep in mind that the setting of ambitious and clear milestones is key to reducing investor risks and uncertainties and engaging stakeholders and business. The availability of consistent and reliable data is a major factor in determining such indicators.

The LTRS should include an estimate of the contribution of renovation to achieving the EED indicative headline target, defined by Member States in accordance with of Article 3 of the EED, since buildings are one of the most crucial pillars of the energy efficiency policy. This information would help policy makers to shape the future energy efficiency policies and design the appropriate measures.

The following table presents a possible framework for defining indicators and milestones :

EPBD Article 2a	**Indicator** *(with a view to reduction of green-house gas emissions + decarbonisation of building stock + facilitation of cost-effective transformation)*	**Milestone** *(which contribute to union's energy efficiency targets)*

(a) an overview of the national building stock, based, as appropriate, on statistical sampling and expected share of renovated buildings in 2020;	• Number of buildings/dwellings/m2:
	  o Per building type
	  o Per building age
	  o Per building size
	  o Pre climatic zones
	• Annual energy consumption
	  o Per building type
	  o Per end use
	• Annual % of renovated buildings:
	  o per renovation type
	  o per building sector – residential/non residential
	• Renovated squared m2
	  o per building type
	  o per building size,
	  o per age of buildings
	• number of EPCs
	  o per building type
	  o per energy class
	• Number / m2 of NZEBs
	  o Per building sector
		• Energy savings (in absolute and relative % terms) per building sector (residential / non residential/etc.)
		• % of renovated buildings (per renovation type)
		• CO_2 Emission reduction in the building sector (renovation / new buildings)
		• % of NZEBs (per building sector)

(b) the identification of cost-effective approaches to renovation relevant to the building type and climatic zone, considering potential relevant trigger points, where applicable, in the life-cycle of the building;	• Cost effectiveness of the main renovation measures (cost-effectiveness indicators: e.g. net present values, payback period, investment costs per annual savings)
	  o Per building type
	  o Per climatic zone
	• Total energy saving potential
	  o per building sector	

(c) policies and actions to stimulate cost-effective deep renovation of buildings, including staged deep renovation, and to support targeted cost-effective measures and renovation for example by introducing an optional scheme for building renovation passports;	• Total and annual share of buildings undergoing deep and NZEB renovation • Public incentives for deep renovation *[this may be difficult to quantify]* • Public and private investments in deep renovations *[this may be difficult to quantify]* • Energy savings from deep renovations	

(d) an overview of policies and actions to target the worst performing segments of the national building stock, split-incentive dilemmas and market failures, and an outline of relevant national actions that contribute to the alleviation of energy poverty;	• Public investments in policy addressing the issues mentioned in the paragraph (split incentives, energy poverty, etc.)
	• % of rented houses with EPC below a certain performance level
	• Energy poverty indicators
	  ○ % of people affected by energy poverty
	  ○ Proportion of disposable household income spent for energy
	  ○ Arrears of utility bills,
	  ○ population living in inadequate dwelling conditions (e.g. leaking roof) or with inadequate heating and cooling
	• % of buildings in the lowest energy classes
		• % Reduction of people affected by energy poverty
		• % Reduction of buildings in the lowest energy classes

(e) policies and actions to target all public buildings;	• M^2 of renovated public buildings
	  ○ Per building type
	  ○ Per building size
	  ○ Per climatic zone
		• Energy savings in public buildings

(f) an overview of national initiatives to promote smart technologies and well-connected buildings and communities, as well as skills and education in the construction and energy efficiency sectors;	• Number of buildings equipped with building energy management systems (BEMS) or similar smart systems • Per building type (focus on non-residential) • Public and private investments in smart technologies (including smart grids) • Citizens participating in energy communities • Number of graduated students - university courses with focus on energy efficiency and related smart technologies - professional / technical trainings (EPC certificators, HVAC inspectors, etc.) • Budget of national research programs in the field of building energy efficiency • Participation of national universities in international scientific research projects (e.g. H2020) on energy efficiency in buildings related topics	• Percentage of buildings equipped with building energy management systems (BEMS) or similar smart systems ○ Per building type
(g) an evidence-based estimate of expected energy savings and wider benefits, such as those related to health, safety and air quality.	• Reduction in energy costs per household (average)? / Decrease in energy poverty • Actual energy savings achieved? • Average/aggregate Indoor air quality indexes (IAQI) and thermal comfort index (TCI) • Cost of avoided illnesses/reduction in health costs attributable to energy efficiency measures? • DALY / QALY improvements attributable to the improvement of building stock and living conditions • Labour productivity gains from better working environment and improved living conditions • Reduction of emissions • Employment in the building sector (number of jobs created per million invested in the sector) • GDP increase in the building sector • % energy import for the Member State (energy security measures)	

(a) the aggregation of projects, including by investment platforms or groups, and by consortia of small and medium-sized enterprises, to enable investor access as well as packaged solutions for potential clients;	Number of Integrated / aggregated projects	
(b) the reduction of the perceived risk of energy efficiency operations for investors and the private sector;	Perceived risk of energy efficiency operation (survey-based) *[may be hard to quantify]*	
(c) the use of public funding to leverage additional private-sector investment or address specific market failures;	Public investments as percentage of total investments in energy saving Public private partnership initiatives	
(d) guiding investments into an energy efficient public building stock, in line with Eurostat guidance; and	Investment in energy efficiency renovation on the public building stock	
(e) accessible and transparent advisory tools, such as one-stop-shops for consumers and energy advisory services, on relevant energy efficiency renovations and financing instruments.	- One-stop-shop initiatives in place - Awareness raising initiatives (number, target audience reached, target audience taking action);	- Number of one-stop-shop intiatives - awareness is raised and leads to concrete actions

3.3. Carry out a public consultation and monitor implementation

According to Article 2a(5):

> ***To support the development of its long-term renovation strategy, each Member State shall carry out a public consultation on its long-term renovation strategy prior to submitting it to the Commission. Each Member State shall annex a summary of the results of its public consultation to its long-term renovation strategy.***
> ***Each Member State shall establish the modalities for consultation in an inclusive way during the implementation of its long-term renovation strategy.***

This is a new element of LTRS which did not exist under Article 4 EED.The consultations relate to the complete long term renovation strategy, including the financing mechanisms to mobilise investment to which Member States are to facilitate access.

Member States may already have in place consultation procedures for the development of major policy or legislative initiatives which could be applied in the case of the elaboration of an LTRS.[23]

Article 2a(5) of the revised EPBD leaves the door open as regards the consultation format (e.g. open or targeted) and method (e.g. face-to-face meetings/events, written submissions or internet-based questionnaire).

The requirement to carry out a public consultation is clearly set out in the revised EPBD. In order to comply with the Directive, Member States are obliged to perform the public consultation, irrespective of whether the requirement has been laid down in national legislation.

Member States may also consider setting up a Stakeholder Platform.[24] The identification and consultation of stakeholders can contribute substantially towards the successful implementation of a long-term strategy for the energy renovation of buildings. The direct or indirect contribution of relevant stakeholders associated with the energy upgrade of buildings, is also essential for dissemination of the LTRS and collection of data and can create a sense of consensus and acceptance of LTRS.[25]

Member States may take the above mentioned elements into account for the purpose of establishing their public consultations and should ensure that they are carried out in an inclusive way and should ensure sufficient time to consult on the LTRS before submitting their strategy to the Commission.

A summary of the consultation must be annexed to the LTRS and this summary could highlight for example the duration, period, type (open or targeted), method (face-to-face meetings/events, written comments or internet-based), number of participants, type of participant – associations, citizens, architects, etc. – basic comments, conclusions.

Public consultation can help achieve better policy results and therefore the revised EPBD introduces a requirement to carry out public consultations while leaving the definition of the methodology and process up to each Member State.

[23] Under the Governance Regulation, Member States are also required to have a public consultation procedure in place for the purpose of preparing the draft and final Integrated National Energy and Climate plans (INECP) well before their adoption, without prejudice to any other Union law requirements.

[24] For example, see www.buildupon.eu

[25] In the political agreement for the Governance Regulation Member States must establish a permanent multi-level energy dialogue, bringing together local authorities, civil society organisations, the business community, investors and other relevant stakeholders to discuss options envisaged for energy and climate policies.

3.4. Consideration of safety issues

The renovation of buildings is an opportunity to take into consideration fire- or seismic-related safety issues, while keeping in mind relevant national regulations.[26] The trigger points mentioned above may also be opportune moments for assessing safety issues in a building.

Article 2a(7) provides that Member States may use LTRS in order to address fire safety and risks related to intense seismic activity affecting energy efficiency renovations and the lifetime of buildings. Nevertheless, this provision should be read in combination with Article 7[27] of the revised EPBD, which requires Member States to address the issues of fire safety and risks related to intense seismic activity in buildings undergoing major renovation.

Those who are energy poor are more likely to rent cheaper, older housing where adequate electrical installations are obsolete (among other issues).[28] Measures such as regular inspections (in particular before undertaking a renovation) and upgrades to bring electrical installations up to safety standards dramatically increase levels of electrical safety. The safety inspection of electrical and gas installations and appliances is also to be encouraged.

Regarding the structural design of buildings and other civil engineering works, the European standards (called "Eurocodes") provide a complete and modern design tool for seismic safety[29] and structural fire design.[30]

Member States are also expected to apply the common performance assessment and classification methods developed under the European legislation on construction products regarding their reaction to fire performance[31] their resistance to fire[32] and their performance when used in roofs[33] having in mind the need for non-combustible materials that do not contribute to fire spread and allow safe escape.

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[26] In line with the subsidiarity principle, safety issues are regulated at Member State level. Issues such as those related to the choice of materials, to horizontal building safety regulations, and to structural performance of the building, are regulated at national level and are out of the scope of the Directive.

[27] Article 7 EPBD in its new final paragraph adds two new obligations in relation to buildings undergoing major renovation: first that MS are to encourage high-efficiency alternative systems, in so far as technically, functionally and economically feasible; and second, that MS are to address the issues of healthy indoor climate conditions, fire safety and risks realted to intense seismic activity.

28 In the European Union, degraded or faulty electrical installations cause 32 home fires every hour—representing 20 to 30% of all domestic fires. Source https://www.energypoverty.eu/news/addressing-safety-and-energy-poverty-better-protect-vulnerable-consumers (last checked October 2018).

[29] EN 1998: Design of structures for earthquake resistance (Eurocode 8).

[30] Specific parts of EN 1991, EN 1992, EN 1993, EN 1994, EN 1995, EN 1996 and EN 1999 applicable for various materials e.g. concrete, steel, timber, etc.

[31] Commission Delegated Regulation (EU) 2016/364 of 1 July 2015 on the classification of the reaction to fire performance of construction products pursuant to Regulation (EU) No 305/2011 of the European Parliament and of the Council (OJ L 68, 15.3.2016, p.4).

[32] Commission Decision 2000/367/EC of 3 May 2000 implementing Council Directive 89/106/EEC as regards the classification of the resistance to fire performance of construction products, construction works and parts thereof (OJ L 133, 06.06.2000, p. 26).

[33] Commission Decision 2001/671/EC of 21 August 2001 implementing Council Directive 89/106/EEC as regards the classification of the external fire performance of roofs and roof coverings (OJ L 235, 04.09.2001, p. 20).

Member States can also encourage the installation of appropriate ventilation and sprinkler systems and should ensure the safe and correct installation of equipment that could have a fire-safety impact, such as PV panels or recharging points for electric vehicles.

Finally, there is also an important role for fire prevention measures and policies such as fire safety inspections, awareness raising through home visits and mitigating measures such as the installation of smoke detectors.

Regarding fire safety, Member States and interested stakeholders may also benefit from the work under the Fire Information Exchange Platform (FIEP) created by the Commission to facilitate the exchange of information between the competent Member States authorities and other stakeholders allowing them to benefit from lessons learned and best practices regarding fire safety. This should enhance the capabilities of Member States regulatory authorities to fulfil their tasks in full knowledge of the advantages and disadvantages of the regulatory choices they have to make.

4. OBLIGATION TO FACILITATE ACCESS TO MECHANISMS TO SUPPORT THE MOBILISATION OF INVESTMENTS (ARTICLE 2A(3))

Paragraph 3 of Article 2a obliges Member States to facilitate access to financial mechanisms to support the mobilisation of investments into the renovation needed to achieve the goals in paragraph 1, namely a highly energy efficient and decarbonised building stock by 2050 and the cost-effective transformation of existing buildings into nearly-zero-energy buildings. Article 2a(3) sets out possible mechanisms for mobilising investments and builds on Article 20 of the EED, which provides that Member States must facilitate the establishment of financing facilities, or the use of existing ones, for energy efficiency improvement measures.

Article 2a(3) provides that:

> ***To support the mobilisation of investments into the renovation needed to achieve the goals referred to in paragraph 1, Member States shall facilitate access to appropriate mechanisms for:***
>
> ***(a) the aggregation of projects, including by investment platforms or groups, and by consortia of small and medium-sized enterprises, to enable investor access as well as packaged solutions for potential clients;***
>
> ***(b) the reduction of the perceived risk of energy efficiency operations for investors and the private sector;***
>
> ***(c) the use of public funding to leverage additional private-sector investment or address specific market failures;***
>
> ***(d) guiding investments into an energy efficient public building stock, in line with Eurostat guidance; and***
>
> ***(e) accessible and transparent advisory tools, such as one-stop-shops for consumers and energy advisory services, on relevant energy efficiency renovations and financing instruments.***

This is a new element of LTRS which did not exist under Article 4 EED.

To drive their LTRS, Member States will need to create access to a range of financial mechanisms to support the mobilisation of investments. The following list includes out a non-exhaustive set of generic examples of the type of financial mechanisms.

(a) aggregation of projects

- *Procurement by a municipality of an energy-service contract[34] for the retro-fit of multi-family buildings to be financed through energy-savings;*
- *Capacity-building and stakeholder dialogue aimed to improve the ability of relevant entities to propose aggregation services ;*
- *Procurement by a group of municipalities of an energy-service contract for some of their public buildings;*
- *Offering integrated renovation services (an entity – e.g. energy agency, local or regional authority, ESCO, financial institution – could create a one-stop-shop offering renovation services and financing, in a rather standardised way, making it possible to refinance the aggregated projects);*
- *See also Section 7.2 of the abovementioned 2016 Good practice Commission document.*

(b) reduction of the perceived risk

- *Standardisation, such as protocols, certification, standards that reduce performance risks ex post;*
- *Mortgages/hypotheques which take into account positive impact of energy efficiency component of project on value of the asset and on default risk;*
- *Refinancing (funds, bonds, factoring) which provide long-term financing to ESCOs and financial investors;*
- *On-tax financing which collects the repayment for money lent for investment in building improvements through property tax; on-bill financing which is a similar mechanism that collects the repayment through the utility-bill with the energy savings covering the investment costs;*
- *Support building up evidence on the real technical and financial performance of energy efficiency investments (e.g. contributing to the European DEEP database, or creating similar national databases);*
- *Encourage the development and use of guidance on how to assess the risk for energy efficiency investments;*
- *Guarantees for beneficiaries and guarantee facilities for financial intermediaries;*
- *See also Section 7.3 of the abovementioned 2016 good practice Commission document.*

[34] Energy performance contracting can deliver improvements on infrastructure and equipment performance. Usually up-front investment by the client is not necessary and the energy efficiency investments are repaied directly through the energy savings generated. See JRC information page https://e3p.jrc.ec.europa.eu/articles/energy-performance-contracting as well as the H2020 Transparense project www.transparense.eu. The core principles of Energy performance contracts are outlined in the "EPC Code of Conduct" http://www.transparense.eu/eu/epc-code-of-conduct/.

(c) use of public funding

- *Loan schemes co-financed by public funds*
- *Risk-sharing instruments (e.g. loans, guarantee facilities and technical assistance)*
- *Grants targeting vulnerable consumers*
- *Grants for technical assistance and for covering the costs with energy performance certificates and energy audits (when these are not mandatory, to encourage their use and raise awareness on investment opportunities)*
- *Energy efficiency funds*
- *See also Section 7.1 of the abovementioned 2016 good practice Commission document.*

(d) guiding investments into an energy efficient public building stock

- *Assistance for the use of Energy performance contracts (market facilitators, framework contracts, practical guides…)*
- *Legislative framework favourable to the development ESCO and of the energy services market more in general*
- *Capacity building through project development assistance, training, peer-to-peer assistance, etc.*
- *Facilitate aggregation of small projects in public buildings (e.g. aggregation of similar projects from different municipalities, or different public owners).*

(e) accessible and transparent advisory tools and energy advisory services

- *One-stop-shop or integrated service for financing and renovation;*
- *Advisory services*
- *Technical guidance on financing and renovation*
- *Financial education to improve the understanding of different financial instruments.*

Good practice examples of financing mechanisms are set out in Section 7 of this document, Guidance on good practices.

These provisions are in line with the Smart Finance for Smart Buildings (SFSB) initiative. The three pillars of the SFSB initiative are:

(1) More effective use of public funds, through:

- capacity building actions to further deploy financial instruments (ex. the Sustainable Energy Investments Forums);
- development of flexible energy efficiency and renewable financing platforms;
- clarification on the accounting treatment of energy performance contracts.

This will enable more effective channelling and combination of public funds and it will support a faster deployment of financial instruments.

Flexible financing platforms will make available more attractive financing options to final beneficiaries through the sharing of risk and the optimised used of public funds, including European Structural and Investment Funds and financing through the European Fund for Strategic Investments.

(2) Aggregation and project development assistance, by:

- reinforcing the Project Development Assistance available at EU level;
- encouraging the development of local/regional one-stop-shops for energy efficiency services.

This will help project developers bring good project ideas to maturity, will facilitate the access of buildings owners, households and companies to information and to energy efficiency services, enabling the development of large-scale investment programmes. The dedicated one-stop-shops at the local or regional level will facilitate the aggregation of different projects, making them more attractive for the financial market.

(3) De-risking, mainly through two products developed together with the Energy Efficiency Financial Institutions Group (EEFIG):

- an open source database providing evidence on the real technical and financial performance of energy efficiency investments – the De-risking Energy Efficiency Platform (DEEP);[35]
- a consensual framework for underwriting energy efficiency investments (the EEFIG underwriting tool[36]), aimed to provide guidance on how to assess the risks and benefits associated to energy efficiency investments.

This will help the market correctly assess the risks, but also the benefits associated with energy efficiency investments, making these investments more trusted and more attractive for project promoters, investors and financial institutions.

In addition, according to the political agreement on the Governance Regulation (see Annex I), Member States must include in their integrate national energy and climate plans a general overview of the investments needed to meet the corresponding objectives, and targets/contributions. This shall include information on the existing investment flows and forward investment assumptions with regard to the planned policies and measures, as well as risk factors/barriers and public finance support or resources to address them.

5. FINANCIAL INCENTIVES AND MARKET BARRIERS - INFORMATION (ARTICLES 10 AND 20)

A number of other EPBD articles relevant for provisions in Article 2a were also revised.

[35] https://deep.eefig.eu/
[36] http://www.eefig.eu/index.php/underwriting-toolkit

5.1. Financial measures linked to savings (Article 10(6)_

Directive 2010/31/EU on the Energy Performance of Buildings acknowledges the role of financial initiatives and information campaigns in order to properly implement the regulatory framework and to give practical effect to the objectives of the Directive.

Article 10(6) provides that:

> ***Member States shall link their financial measures for energy efficiency improvements in the renovation of buildings to the targeted or achieved energy savings, as determined by one or more of the following criteria:***
> ***(a) the energy performance of the equipment or material used for the renovation; in which case, the equipment or material used for the renovation is to be installed by an installer with the relevant level of certification or qualification;***
> ***(b) standard values for calculation of energy savings in buildings;***
> ***(c) the improvement achieved due to such renovation by comparing energy performance certificates issued before and after renovation;***
> ***(d) the results of an energy audit;***
> ***(e) the results of another relevant, transparent and proportionate method that shows the improvement in energy performance.***

This is a new paragraph. It requires that financial measures for energy efficiency improvements must be linked to the targeted or achieved energy savings. The requirement is obligatory for the renovation of buildings subject to public financial support. It is already common practice for such financial measures to be accompanied by conditions or obligations requiring final beneficiaries to prove project performance and the effective use of public money.

Irrespective of whether the renovation in question would constitute a 'major renovation' within the meaning of Article 2, paragraph 10 of the revised EPBD, the obligation on Member States to link financial measures for energy efficiency improvements to the targeted or achieved energy savings applies.

The revised paragraph 6 allows different approaches for linking this financial support to the quality of energy renovation, while it provided flexibility to Member States in the implementation of such measures according to national or regional conditions. These criteria, which constitute an exhaustive list for Member States to choose from, concern the following:

a) the energy performance of the equipment or material used for the renovation;
b) standard values[37] for calculation of energy savings in buildings;

[37] There are already many technologies with standard energy saving values linked to their performance (led lighting, double/triple glazed windows, etc.). In addition several EU funded projects aim to define standard values (multEE project funded under Horizon 2020 http://multee.eu/).

c) comparison of energy performance certificates[38] issued before and after renovation;
d) energy audit;
e) any other relevant, transparent and proportionate method.

Competencies and skills are central to ensure the quality of a renovation and therefore, financial measures for energy efficiency should require that renovation measures are implemented by qualified or certified installers so as to reach the targeted or achieved energy savings. This would be particularly relevant in the case of criterion (a) above whereby a financial measure must be linked to the energy performance of the equipment or material used for the renovation, and where a qualified and certified installer has to be involved in order to install the equipment or material used for the renovation and verify the improvements. However, this requirement has to take under consideration national regulation regarding relevant professions of installers.

Transposition and implementation of Article 10(6)

- Member States can define the criteria to be applied from the exhaustive list provided in paragraph 6.

- Member States should disseminate and communicate the national transposition measures on the revised paragraph 6 of Article 10 with all appropriate authorities/agencies (i.e. operational authorities) responsible for designing and implementing financial measures. This is important so as to ensure that the design and implementation of the financial measure are linked to one ore more of the above mentioned criteria (a) to (e).

- Member States should review their national regulation regarding relevant professions of installers in order to ensure that only qualified and certified installers are involved in the renovation process.

5.2. Databases for energy performance certificates (Article 10(6a))

Article 10(6a) provides that:

> ***Databases for energy performance certificates shall allow data to be gathered on the measured or calculated energy consumption of the buildings covered, including at least public buildings for which an energy performance certificate, as referred to in Article 13, has been issued in accordance with Article 12.***

[38] EPCs are an effective tool to document energy savings as a result of financial support for energy renovation. This is already the case in many financial instruments applied in different MS. EPCs are also the instrument most likely to be used by the Energy Efficiency Mortgage initiative for defining green mortgages (on-going process)

EPC registers and databases can be a key instrument for reinforced compliance, improve the knowledge on the building stock and better inform policy makers and support the decisions of market players.[39]

This new provision does not oblige Member States to establish a database or a registry, but where such a database exists or is introduced, Member States are required to comply with the requirements of new Article 10(6a).[40] Furthermore, the information must only be included in the database if the buildings have already issued an EPC. The information to be included can be either actual or calculated energy consumption. EPCs in principle always include at least one of this information.

The frequency by which the database should be updated with new consumption data is left up to Member States to decide.

The scope of this obligation does not extend to all buildings. The new paragraph 6a of Article 10 requires that consumption data be included on the certificate of the calculated or measured energy consumption for at least public buildings for which an energy performance certificate has been issued on the basis of Article 13, namely buildings occupied by public authorities which are frequently visited by the public with a total useful floor area over 250 m^2 are required to issue an EPC according to Article 12(1) of the revised EPBD.

The Directive leaves flexibility to Member States as to what "frequently visited" means but the interpretation given in transposing Article 10(6a) must be consistent with the corresponding term in Articles 12 and 13 of the EPBD (which have been transposed).

Member States are always free to find this data from other sources and register it in the EPC databases.

Transposition and implementation of Article 10(6a)

- Member States should examine if the existing EPC database allows gathering of measured or calculated energy consumption and modify accordingly if necessary.
- The data of energy consumption of public buildings frequently visited by the public with an EPC shall be introduced in the EPC databases.
- Consumption data should be updated ideally at least once a year.

[39] Recital 34 of the amending Directive (EU) 2018/844 states that *"High-quality data on the building stock is needed and this could be partially generated by the databases that almost all Member States are currently developing and managing for energy performance certificates."*

[40] Recital 34 of the amending Directive (EU) 2018/844 clarifies that *"…Where the independent control system for energy performance certificates* ***is complemented by an optional database going beyond the requirements of Directive 2010/31/EU*** *…"*.

5.3. Aggregated anonymised data (Article 10(6b))

Article 10(6b) provides that:

> ***At least aggregated anonymised data compliant with Union and national data protection requirements shall be made available on request for statistical and research purposes and to the building owner.***

This new paragraph requires Member States to take the necessary action in order at least aggregated anonymised to be made available on request for statistical and research purposes and to the building owner. This data has to be compliant with Union and national data protection requirements. This measure does not introduce any requirements to make changes to existing databases, but only to make sure that the legislative framework allows the data to be shared.

5.4. Information (Article 20(2))

> Member States shall in particular provide information to the owners or tenants of buildings on energy performance certificates, ***including*** their purpose and objectives, on cost-effective ***measures*** and, where appropriate, financial instruments, to improve the energy performance of the building, ***and on replacing fossil fuel boilers with more sustainable alternatives. Member States shall provide the information through accessible and transparent advisory tools such as renovation advice and one-stop-shops.***
>
> At the request of the Member States, the Commission shall assist Member States in staging information campaigns for the purposes of paragraph 1 and the first subparagraph of this paragraph, which may be dealt with in Union programmes.

Article 20 was revised in order to clarify Member States' obligation to provide information to the tenants or owners. The cases provided are a non-exhaustive list and now include the obligation to provide information on replacing fossil fuel boilers[41] with more sustainable alternatives.

Revised paragraph 2 of Article 20 further requires that Member States shall provide the information through accessible and transparent advisory tools such as renovation advice and one-stop-shops.

[41] Fossil fuel boilers are boilers in which steam is generated by firing coal, oil, wood or gas. Ecodesign requirements for fossil fuel gas and oil boilers up to 400 kW apply today and ban certain products from being placed on the market based on energy efficiency and NOx emissions. Ecodesign requirements for fossil fuel coal boilers will start to apply on 1 January 2022 and will ban certain products from being placed on the market based on energy efficiency and NOx, PM, CO2 and VOCs emissions. The gas and oil boilers are covered by 813/201341 and coal boilers by 2015/1189 (implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for solid fuel boilers). The regulation does not ban fossil fuel boilers from the market.

6. ISSUES RELATED TO GOVERNANCE / DEADLINES FOR REPORTING

[To be completed/updated once the final text is adopted.]

The political agreement on the Energy Union Governance Regulation explicitly states that:

- the long-term renovation strategies shall be part only of the final (and not the draft) integrated national energy and climate plans; and
- the first long-term renovation strategy, as revised with the Directive 2018/844/EU, shall be submitted to the Commission by 10 March 2020, namely the transposition deadline for Directive (EU) 2018/844.

The final text of the Energy Union Governance Regulation is not yet finalised and approved, but some points can already be mentioned. In particular:

- Each Member State must set out in its integrated national energy and climate plan the indicative milestones of the long-term strategy for the renovation of the national stock of residential and non-residential buildings, both public and private, the roadmap with domestically established measurable progress indicators, an evidence-based estimate of expected energy savings and wider benefits, and the contributions to the Union's energy efficiency targets pursuant to Directive 2012/27/EU in accordance with Article 2a of the revised EPBD.
- Member States must include in the integrated national energy and climate progress reports the information about the indicative milestones of the long-term strategy for the renovation of the national stock of residential and non-residential buildings, both public and private, and the contributions to the Union's energy efficiency targets pursuant to Directive 2012/27/EU in accordance with Article 2a of the revised EPBD.

In addition, the Energy Union Governance Regulation includes an Annex providing the general framework for the integrated national energy and climate plans:

- Under the section describing the national objectives and targets for the energy efficiency dimension, Member States must, among others, include the indicative milestones for 2030, 2040 and 2050, the domestically established measurable progress indicators and their contributions to the Union's energy efficiency targets as included in the roadmaps set out in the long-term renovation strategies for the national stock of residential and non-residential buildings, both public and private, in accordance with Article 2a of the revised EPBD.
- Under the section describing the policies and measures for the energy efficiency dimension, Member States must, among others, include the long-term renovation strategy to support the renovation of the national stock of residential and non-residential buildings, both public and private, including policies, measures and actions to stimulate cost-effective deep renovation and policies and actions to target the worst performing segments of the national building stock, in accordance with Article 2a of the revised EPBD.

7. GUIDANCE ON GOOD PRACTICES FOR IMPLEMENTING THE OBLIGATIONS OF ARTICLE 2A

The following section sets out guidance on good practices for implementing the obligations set out in Article 2a. It follows the structure of the previous section.

The building renovation strategies submitted by Member States in 2014 and 2017 under Article 4 of the EED will be the building blocks for future LTRS.

Guidance for National Energy Efficiency Action Plans[42] (hereafter referred to as "the NEEAP Guidance") already included detailed indications on certain elements to be elaborated in building renovation strategies – relevant sections will be mentioned below.

7.1. Overview of the national building stock (Article 2a(1)(a))

Detailed indications on items to be listed in the overview of national building stock were set out in Annex B, Section 1, (Guidance 57) of the NEEAP Guidance.

The 2017 LTRS from Wallonia (Belgium), France and Malta are good practice examples of how to present an overview of the national building stock.[43]

7.2. Cost effective approaches to renovation (Article 2a(1)(b))

The NEEAP Guidance provided, in Annex B, Section 2, detailed indications on how to identify cost-effective approaches.

The 2014 LTRS from the Brussels Capital Region and the 2017 LTRS from Wallonia (Belgium) and Bulgaria were highlighted as good practice examples of cost-effective approaches to renovation.[44]

See also the 2016 BPIE factsheet on trigger points: "Trigger points as a must in national renovation strategies."[45]

Rental and energy performance

The Dutch government announced that from 2023 buildings must have at least a C energy rating in order to be rented as office space.[46]

[42] SWD(2013) 180 final, https://ec.europa.eu/energy/sites/ener/files/documents/20131106_swd_guidance_neeaps.pdf

[43] JRC Science for Policy Report: Assessment of Second Long-term Renovation Strategies under the Energy Efficiency Directive, 2018

[44] JRC Science for Policy Reports: Synthesis Report on the assessment of Member States' building renovation strategies (2016) and Assessment of Second Long-term Renovation Strategies under the Energy Efficiency Directive (2018)

[45] http://bpie.eu/publication/trigger-points-as-a-must-in-national-renovation-strategies/

Scotland introduced a new measure that mandates renovation of low performing social housing.

In Greece, a similar approach applies according to which buildings, in order to be leased or acquired by the public sector are required to have an EPC rating of at least "C". This obligation will apply to all existing lease contracts by 2020.

7.3. Policies and actions towards deep renovation (Article 2a(1)(c))

In Annex B, Section 3, the NEEAP Guidance provided indications on information that should be provided with regard to policies and measures to stimulate cost-effective deep renovations. The 2017 LTRS from the Brussels Capital Region and France are good practice examples of measures to stimulate deep renovation.[47]

Roadmaps

The iBRoad project[48] is working on developing an Individual Building Renovation Roadmap for single-family houses. The tool looks at the building as a whole and provides a customised renovation plan over a long-term horizon (15-20 years) – an iBRoad-Plan – combined with a building logbook or passport that keeps a record of energy-related interventions. iBRoad found that homeowners and buyers need more user-friendly and trustworthy advice on the best steps to follow when performing energy renovations.

iBRoad has produced a report 'The Concept of the Individual Building Renovation Roadmap – An in-depth case study of four frontrunner projects'. This addresses the process behind the creation of an Individual Building Renovation Roadmap and covers the key issues that need to be addressed to allow its development and implementation. It also presents four real-life examples: Denmark (BetterHome[49]), Flanders (Woningpas and EPC+), France (Passeport Efficacité Énergétique) and Germany (Individueller Sanierungsfahrplan).[50]

ALDREN[51] also proposes to develop building passports for step-by-step renovation, whilst at the same time providing harmonised energy performance ratings via a common European Voluntary Certification scheme.

Building-related information

IEE Project Request2Action[52] worked on EPCs and how to improve uptake of their recommendations. The solution they proposed in Request2Action, which in some cases

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46 https://www.akd.nl/en/b/Pages/Office-building-with-energy-label-D-or-worse-banned-as-from-2023.aspx (web page last visited October 2018).

47 https://ec.europa.eu/energy/sites/ener/files/documents/2014_article4_en_denmark.pdf

48 http://ibroad-project.eu/

49 http://bpie.eu/publication/boosting-renovation-with-an-innovative-service-for-home-owners/

50 http://ibroad-project.eu/news/the-concept-of-the-individual-building-renovation-roadmap/

51 www.aldren.eu

52 http://building-request.eu/

comes close to a passport, is a 'hub' or 'one-stop-shop' for buildings-related information. One such example is the Portuguese hub 'Casa+' which has the ambition to store for each (residential) dwelling the EPC and related data, making offers for renovation possible, the outcomes of which would then also be registered in the Hub. Further details can be found in the report 'Recommendations on building Hubs'.[53]

7.4. Policies and actions towards worst-performing buildings and energy poverty (Article 2a(1)(d)

7.4.1. Worst performing segments of the national building stock

ENERFUND,[54] a Horizon 2020 project, addresses the need to provide easy-to-access and reliable assessment of the energy savings to be obtained through deep energy retrofits, in order to increase the rate of such projects within Europe. In practice, the project is developing a decision-making tool rating deep renovation opportunities against a set of parameters – like a credit score used by banks to rate clients. The tool is presented as an online map displaying the energy performance of individual buildings.

In Denmark, all social housing associations contribute to a common “solidarity fund” every month. This fund is used to renovate the worst performing buildings

Rental property restrictions related to energy performance (such as in Section 6.2 above) are also an effective measure to encourage the renovation of worst-performing buildings.

Tax mechanisms are another means by which Member States can encourage the renovation of energy inefficient buildings; examples include tax incentives, such as an income tax deduction for certain energy effiency renovation costs in Denmark, or an energy tax applied to energy consumption in the Netherlands.[55]

7.4.2. Split incentive dilemmas

Rental property restrictions related to energy performance are also an effective measure to encourage the renovation of energy inefficient buildings. Some examples include: Forcing landlords to make improvements[56] or applying minimum performance levels for rented units such as an obligation for roof insulation in rental dwellings in the Flemish Housing Code or minimum EPC-level requirement for office rentals in the Netherlands.

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[53] http://building-request.eu/sites/building-request.eu/files/d4.1_recommendations_report_final.pdf

[54] http://enerfund.eu/

[55] http://publications.jrc.ec.europa.eu/repository/bitstream/JRC97408/reqno_jrc97408_online%20nzeb%20report%281%29.pdf

[56] For example, recent UK policy https://www.gov.uk/government/consultations/domestic-private-rented-sector-minimum-level-of-energy-efficiency

7.4.3. Market failures

The NEEAP Guidance, Annex B, Section 3(b) included an analysis of barriers as one of the elements of information that should be provided and according to Section 3(d) of Annex B, new policy measures should address those barriers.

The Impact Assessment that accompanied the proposal to revise the EPBD[57] also addresses barriers that hamper further uptake of energy efficiency investments in buildings.

7.4.4. Alleviation of energy poverty

The JRC's assessment of the 2017 LTRS gives an overview of the direct (specific policies and measures) and indirect references (general strategies or initiatives) that Member States have made to on-going or planned efforts related to energy poverty. Many of the measures concern financial incentives targeting segments of the population considered under energy poverty line, low-income households or social housing units. Some countries introduced specific actions targeting energy poverty under their energy efficiency obligation schemes, while other set up dedicated awareness raising and advisory services.

The EU Energy Poverty Observatory is a valuable source of data and statistics. It has developed energy poverty indicators, gathered an extensive catalogue of policy measures and a comprehensive repository of research. The Observatory aims to help stakeholders (policy-makers, NGOs, public authorities of different levels, researchers and practitioners) involved in energy poverty policy designing or its implementation to define the phenomenon, and advise on measuring it. It also facilitates exchange of good practice and provides training materials. The Observatory can be of assistance to Member States directly in providing advice and expertise – both ad hoc and via its extensive Advisory Board, comprising experienced experts in all the different aspects of energy poverty.

In France, fuel poverty is addressed through actions of the National housing agency and its 'Habiter mieux' (Living better) programme. France has also created a new obligation under its energy savings certificates scheme specifically aimed at combating fuel poverty. Actions funded by this scheme will be implemented among low-income households. A "Fuel poverty observatory" was also set up in France with the aim to better measure fuel poverty situations and monitor public and private financial aid granted to disadvantaged households together with actions under local or national initiatives.

Under the Government's Strategy to Combat Energy Poverty and the Healthy Ireland Framework, the Irish authorities have set up the Warmth and Wellbeing scheme, a pilot initiative with the objective to validate, in an Irish context, the international evidence that suggests making homes warmer and more energy efficient can have a positive effect on the health and wellbeing of people in energy poverty who are also living with a chronic respiratory condition such as COPD & Asthma. Ireland has also the Social Housing

[57] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016SC0414&from=EN

Investment Programme, local authorities are allocated capital funding each year in respect of a range of measures to improve the standard and overall quality of their social housing stock including retrofit measures aimed at improving energy efficiency.

The Irish Energy Action, in partnership with the EU-project Episcope, have developed an EPC mapping tool.[58] The interactive map over Dublin illustrates different building characteristics (including energy poverty indicators) of different neighbourhoods. The data is aggregated to defined boundaries, namely small areas and electoral divisions. This mapping allows for local policy making and strategy development alleviating energy poverty from a district approach.

In Austria, a bonus factor is included in the energy efficiency obligation scheme whereby savings achieved in low-income households are weighted with a factor of 1.5. In addition, energy suppliers must make an information and advice centre available, including the provision of energy advice related to energy poverty. Other examples of dedicated regional/local programmes in Austria include the energy advice scheme in Vienna, and electricity-saving project for low-income households in the districts of Braunau, Freistadt & Linz-Land.

The Netherlands has put in place the Energy Saving Agreement for the Social Rental Sector, setting the objective for the housing association sector to achieve an energy label B (equivalent to energy index 1.25) on average by 2020.

Other examples include the PLAGE SISP programme in the Brussels Capital Region, subsidies for implementation of individual energy efficiency measures in vulnerable households in Croatia, JESSICA programmes in Lithuania and Czech Republic, personalised advisory services for EE for households with low income in Luxembourg, etc. Italy and France have in place social bonus or discounts on energy bills for low income families.

The REACH[59] project addressed energy poverty by training teachers and students in vocational schools to become energy advisors. REACH partners implemented about 1,600 household visits where basic energy efficiency measures were put into place. In Slovenia the project helped to trigger a nation-wide scheme addressing energy poverty in households. Training packages, as well as the final impact report are available on the project website

The ASSIST[60] project aims to tackle energy poverty and support vulnerable consumers by creating specialised services via Vulnerable Consumer Energy Advisors (VCEAs) and a

[58] http://bpie.eu/wp-content/uploads/2017/05/Factsheet_B-170511_v4.pdf
[59] http://reach-energy.eu/
[60] Some of the deliverables produced by the ASSIST project could be relevant: A report on the main initiatives at national / regional / local level to address energy poverty in the participating countries: https://www.assist2gether.eu/documenti/risultati/report_on_replicable_best_practice_national_and_european_measures.pdf); A report on financial measures put in place in the participating countries: https://www.assist2gether.eu/documenti/risultati/report_best_practice_guide_on_financial_measures.pdf

corresponding network. Those energy advisors are to be selected among people with direct experience of vulnerability and/or energy poverty, training them to increase their skills for future employability and maximise the peer-to-peer benefits that this can offer. The actions include, for example, working with feedback systems, energy audits, community based initiatives, getting support in obtaining available funds for energy efficiency, testing innovative funding mechanisms.

Other projects addressing the energy efficient renovation of buildings with a focus on social housing.

The FIESTA[61] project did not specifically address energy poor households, but a good share of the households engaged were in social housing. The FIESTA project tackled heating and cooling efficiency in families, with particular attention paid to families that could represent a more vulnerable category. Energy Helpdesks were set up in 14 cities as a free service. The Helpdesks provided advice to citizens individually, either face to face or online, and customised door-to-door energy audits to families. At least 39 other European cities have officially committed themselves to replicating the FIESTA model. The project developed user-friendly energy saving guidance materials for households such as the "FIESTA Energy Efficiency Guide" and short animations, which are available in Bulgarian, Croatian, English, Greek, Italian and Spanish.

ENERSHIFT (H2020, 02/2016 – 01/2019):[62] The project targets the social housing sector in the Liguria region, in Italy. It provides technical assistance for the preparation of feasibility studies, with the final objective to launch a tender for investments by Energy Service Companies (ESCOS) through an energy performance contract. The project also considers the use of structural funds to trigger investment. The target is to have an investment programme of nearly EUR 15 million, resulting in primary energy savings equal to 14.5 GWh/y.

In September 2018, the awarding procedure of the first EnerSHIFT tender targeting 44 Social Housing Buildings in the province of Genoa was concluded and the corresponding contract should be signed by the end of the year. An agreement was reached with the banking system of the region of Liguria, aimed at facilitating the credit access for Energy Services Companies (ESCOs). Finally, an amendment to the Regional Law (no. 10/2004) ruling the social housing sector was passed to facilitate the implementation of Energy Performance Contracts. Thanks to this amendment, the formal approval of tenants on any proposed Energy Performance Contract is no longer required. Project website:

The TRANSITION ZERO[63] project aims to achieve a wide-scale introduction of net zero energy homes across Europe, looking specifically at refurbishment in social housing. Building on the success of Energiesprong in the Netherlands, Transition Zero is expanding net-zero energy refurbishment in the United Kingdom and in France, using the social housing sector as a catalyst. Energiesprong delivers fully integrated refurbishment packages with

[61] http://www.fiesta-audit.eu/en/
[62] https://enershift.eu
[63] http://transition-zero.eu/index.php/publications/

long-term guarantees that make the solution commercially financeable and scalable. The Transition Zero solution is not in itself limited to alleviation of energy poverty and is applicable also for non-energy poor housing stock, however the TRANSITION ZERO project develops a business model which offers viable solutions for social housing companies to alleviate problems of affordable housing and energy poverty. Relevant reports include: reports on structural finance product for social housing, on energy performance guarantees and refurbishment package delivery protocols, tender specifications, reports on national and regional regulatory context for refurbishment and on market assessment.

7.5. Policies and actions towards public buildings (Article 2a(1)(e))

Croatia:. To facilitate the use of a combination of European Regional Development Fund (ERDF) and Cohesion Fund for the renovation of public buildings, two pilot projects were developed, one for the preparation of detailed design documentation for energy efficiency and RES measures in buildings, and the other for the investment in energy renovation of school buildings. Two specific pilot projects were launched in 2015 and, out of 240 applications, 12 pilot projects were selected for funding (5 for design documentations and 7 for investments in schools).[64]

Slovenia: Heritage public buildings are numerous and have a large energy savings potential however are usually treated as exceptions under the EPBD. If the energy efficiency measures are acceptable from a conservation point of view, such buildings might not easily meet technical and economic thresholds for support under EU structural funds. The Slovenian policy package covers guidelines for energy renovation of heritage buildings (technical recommendations), and includes positive discrimination that enables heritage buildings to qualify for EU cohesion funding.[65]

The Horizon 2020 project Premium Ligh Pro [66] has been working to support the uptake of LED lighting systems among public authorities and private companies across nine EU countries. The aim of the project is to support public authorities in the development of effective policies to facilitate the implementation of efficient new generation LED lighting systems in the service sector. Green procurement criteria and guidelines for indoor and outdoor LED lighting systems have been published on the project website.

EmBuild is a coordination and support project whose main objectives are to increase the capacity of public authorities at regional/municipal level to collect the necessary data

[64] See Concerted Action Report, November 2016 - https://www.epbd-ca.eu/wp-content/uploads/2018/04/CA-EPBD-CCT2-Policies-and-Implementation.pdf
[65] See Concerted Action Report, November 2016 - https://www.epbd-ca.eu/wp-content/uploads/2018/04/CA-EPBD-CCT2-Policies-and-Implementation.pdf
[66] http://www.premiumlightpro.eu/

to prepare ambitious, sustainable and realistic renovation strategies for public buildings; analyse and identify cost-effective approaches to renovations; guide investment decisions; and facilitate private sector involvement.[67]

7.6. Incentives towards smart technologies and skills (Article 2a(1)(f))

7.6.1. Smart technologies

SMART-UP (H2020, 03/2015 - 07/2018)**:** The SMART-UP project aimed to encourage the active use of smart meters and in-house displays by vulnerable consumers in France, Italy, Malta, Spain and United Kingdom. There was a strong engagement strategy in the training of specific stakeholders that are in close contact with vulnerable households. More than 550 frontline staff, mainly social workers, were trained in 46 training sessions and more than 4.460 vulnerable households received their advice on how to use energy more efficiently, on how to read and understand electricity and/or gas meters, and on how to reduce their energy bills. In Spain the SMART-UP project inspired a social programme funded by the Municipality of Barcelona to combat energy poverty. As a result, 100 unemployed people were trained and more than 1,800 vulnerable households were advised. An additional positive outcome has been that 32% of these trained formerly unemployed people are now working in Barcelona's Fuel Poverty Points of Information. Training packages, as well as the final impact report are available at the project website: https://www.smartup-project.eu/

7.6.2. Skills development schemes

BUILD UP Skills[68] is an initiative which aims to unite forces and to increase the number of qualified workers in the building workforce in Europe. The project focuses on the continuing education and training of craftsmen and women and other on-site workers in the field of energy efficiency and renewable energy in buildings and has three main components.

- Establishment of national qualification platforms and qualification roadmaps to 2020 (Pillar I: 2011-2013);
- Development and upgrade of qualification and training schemes (Pillar II: from 2013);
- Europe-wide coordinated support activities (EU exchanges).

BUILD UP Skills Construye2020 (Spain):[69] The project developed an app for mobile devices which can be used as a training tool on good practices for the renovation of buildings related to different activities covering notably aluminium carpentry, insulation, renewable energy systems, energy efficiency and efficient installations. The project is working with the national qualification institute to develop a new qualification for the installer of ground source heat pumps.

[67] http://bpie.eu/wp-content/uploads/2018/09/local_strategies_Final_NEW.pdf
[68] http://www.buildup.eu/en/skills
[69] http://construye2020.eu/

BUILD UP Skills Netherlands@Work (Netherlands):[70] Eight profiles of blue collar professional competences have been created constituting competence profiles for an occupation including the skills required when building energy-neutral buildings. The project developed an app for mobile devices which enables blue collar workers to choose the adequate course based on their previous knowledge.

BUILD UP Skills BEEP (Finland):[71] the BEEP partners have developed an innovative training concept (both for trainers & workers) based on best-practice of energy-efficient construction, based on a comprehensive toolbox including: sets of slides and didactic videos in 5 languages, material dedicated to workers self-learning, a pilot training for 'change agents' (experienced workers/mentors who can help to set an example and explain how to improve the quality of the work) and an on-site training ambassador who plays a critical role in attracting workers' to the pilot trainings.

BUILD UP Skills Qualishell (Romania):[72] The project supported the implementation of national qualification schemes for installers of thermal insulating systems and high efficiency windows systems to ensure high performance building envelopes and support the move towards the implementation of NZEBs.

7.6.3. Training/certification for experts

Germany: the national list of energy efficiency experts for the support programmes of the Federal Government in the field of energy efficiency aims to improve the quality of local energy consulting services by means of uniform qualification criteria, proof of regular advanced training and random checks of the results.

Slovenia: a common training/certification article in its legislation for all three Directives EED, EPBD and RES and is achieving synergies by implementing a co-ordinated modular training approach.

Croatia: training programmes on energy efficiency for professionals (architecture, construction and building services) have been implemented since 2009. The objective is to enhance knowledge of engineers that, with their competencies, are able to consider construction works and buildings as a whole in terms of energy.

7.7. Estimate of energy savings and wider benefits (Article 2a(1)(g))

Section 5 of Annex B of the NEEAP Guidance provided elements that should be evaluated in providing an evidence-based estimate of expected energy savings and wider benefits.

[70] www.buildupskills.nl
[71] http://finland.buildupskills.eu/
[72] http://www.iee-robust.ro/qualishell/en/

The 2017 LTRS from Cyprus, Czech Republic, Finland, Lithuania, Romania and Sweden are good practice examples of strategies that have sought to quantify the wider benefits of building renovation.[73]

COMBI,[74] a Horizon 2020 project, aimed at quantifying the multiple non-energy benefits of energy efficiency in the EU-28 area in order to incorporate the multiple impacts into decision-support frameworks for policy-making. In particular, the project developed an online tool[75] able to visualise and where possible monetise the wider benefits of energy efficiency improvements. Eight out of 21 end-use energy efficiency improvement actions cover buildings[76].

Other resources

- *Joint Research Centre Report: Promoting healthy and highly energy performing buildings in the European Union,[77] 2017;*
- *WHO guidelines on healthy housing [to be published in November 2018 (tbc)];*
- *BPIE study on EU-wide modelling focusing on health, wellbeing and productivity in schools, offices and hospitals. [report commissioned by Buildings 2030 – to be published 27 November 2018 (tbc)].*

7.8. Mechanisms to support the mobilisation of investments (Article 2a(3))

The following guidance relates to the different types of financial mechanism which Member States should facilitate access to.

Another relevant source of examples of successful schemes is Chapter 7 of the Good practice document on energy efficiency which was published together with the Clean Energy Package in November 2016 (SWD(2016) 404 final.[78]

7.8.1. aggregation of projects

- PadovaFIT![79] aims to retrofit multifamily buildings through energy performance contracting. The project aggregates demand within a municipality by grouping all the subscribing buildings to generate a critical mass, achieve favourable economic conditions, and guarantee the quality of the works to be carried out by the bidders. Since 2014, the consortium has been engaging condominiums throughout the City of Padova (Italy) in order to build significant demand for

[73] JRC Science for Policy Report: Assessment of Second Long-term Renovation Strategies under the Energy Efficiency Directive (2018)
[74] https://combi-project.eu/
[75] https://combi-project.eu/tool/
[76] 1. residential refurbishment of the building shell + space heating + ventilation + space cooling (air-conditioning); 2. residential new dwellings; 3. residential lighting (all dwellings); 4. residential cold appliances (all dwellings); 5. non-residential refurbishment of building shell + space heating + ventilation + space cooling (air-conditioning); 6. non-residential new buildings; 7. non-residential lighting (all buildings); 8. non-residential product cooling (all buildings).
[77] http://publications.jrc.ec.europa.eu/repository/bitstream/JRC99434/kj1a27665enn%281%29.pdf
[78] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1535361114906&uri=CELEX:52016SC0404
[79] http://www.padovafit.it/english/

energy retrofits. In the meantime, the municipality has procured a private ESCO, which will enter into a contract with each condominium, and then finance the energy retrofit, which will be paid for through the energy savings.

- Project MARTE[80] developed deep energy retrofit investments in buildings of the healthcare sector of the Italian Marche Region. The project designed and operationalized a complex financing structure integrating public (ERDF) and private (ESCO/EPC) resources in a target-oriented way. It also laid down the foundation for larger-scale replication not only in further healthcare structures of the region and in Italy, but also in other sectors like social housing and waste management, in particular by capacity building and promotion of the EPC model;
- Project ZagEE[81] enabled the realization of an aggregated portfolio of energy efficiency and renewable energy investments in the City of Zagreb by providing tailored project development assistance. It targeted the retrofitting of both public buildings (i.e. city office buildings, primary and high schools, kindergartens, health centres, retirement homes etc.) and public lighting. The tailored funding scheme applied budgetary resources, bank loans, as well as national and EU grants;
- In the ESCOLimburg2020[82] project, the public energy grid operator Infrax developed an integrated service to accelerate the energy renovation of municipal buildings, covering all steps from audits to works implementation and finance. Over €20 million have been invested in the refurbishment of public buildings
- Project PARIDE is excellent example of "bundling" (in this particular case for the renewal of public street lighting) without upfront investment costs for the municipalities and with reduced transaction costs due to joint procurement procedures for a 25 mio EUR energy performance contracts programme for 33 municipalities in the Province of Teramo (IT).
- Guidance on and comparison of innovative finance models for building renovation in Europe[83] as collected by the CITYNVEST[84] project with the report "A review of local authority innovative large scale retrofit financing and operational models" and the guidance on "How to launch ambitious energy retrofitting projects in your region,"[85] focusing on one-stop-shop approaches to refurbish public buildings.

7.8.2. reduction of the perceived risk of energy efficiency operations

- Standardisation of energy efficiency to increase investors' confidence (deployment of protocols to reduce performance risks, accompanied by training

[80] http://www.marteproject.eu/
[81] http://zagee.hr/
[82] http://www.escolimburg2020.be/en
[83] http://www.citynvest.eu/content/comparison-financing-models
[84] http://www.citynvest.eu/home
[85] http://citynvest.eu/content/guidance-how-launch-ambitious-energy-retrofitting-projects-your-region

on protocol implementation an dcertification of projects – e.g. the Investor Confidence Project (ICP) Europe.[86] ICP Europe, supported by two Horizon 2020 projects: ICPEU and I3CP, develops standardized protocols and associated tools such as project development specifications. In addition, through its stakeholder network ICP Europe provides technical assistance to project developers to certify projects and programmes as being Investor Ready Energy Efficiency (IREE). It works also with financial institutions to help them incorporate IREE into their investment and lending procedures.

- The project SEAF (Standardisation and Communication of Sustainable Energy Asset Evaluation Framework)[87] developed a holistic, IT-based platform for valuation and benchmarking of smaller sized sustainable energy projects (energy efficiency, demand response, distributed renewable energy generation, energy storage etc.) and, thereby, bridged the gap between project developers and investors. The tool developed ("eQuad")[88] integrates the ICP protocols and includes valuation and optimization, as well as risk assessment and transfer (insurance) components.
- The Energy Efficient Mortgage Initiative that aims to create a standardised "energy efficient mortgage" product at European level (the idea is to give preferential mortgages to building owners willing to improve the energy efficiency of their buildings by taking into consideration the positive impact of energy efficiency on the value of buildings and on payment defaults; the pilot phase started in June 2018, with more than 35 banks committed to participate in the pilot scheme);
- Making energy efficiency attractive for institutional investors and supporting the refinancing of energy efficiency related assets (e.g. the Latvian Baltic Energy Efficiency Fund (LABEEF) – providing long term financing to ESCOs by forfaiting EPC contracts[89]; green bonds for energy efficiency);
- The EUROPACE[90] project develops a scalable on-tax financing mechanism, where the long-term repayments obligation is tied to a property and not its owner, with municipalities being the conduit for repayment via a special levy collected with the property tax bill.

7.8.3. public funding to leverage private-sector investment or address market failures

- Loan schemes co-financed by public funds (e.g. Multi-Apartment Building modernization funds (Lithuania);[91] combination of loans, technical assistance

[86] http://www.eeperformance.org/
[87] https://www.seaf-h2020.eu/
[88] https://www.eu.jouleassets.com/about-equad/
[89] http://sharex.lv/en/latvian-baltic-energy-efficiency-facility-labeef
[90] http://www.europace2020.eu/
[91] http://www.vipa.lt/page/dnmfen

and grants for renovation of multi-apartment buildings (Estonia);[92] KfW grants and loans for energy renovation[93] (Germany); SlovSEFF (Slovakia);[94]

- Risk-sharing instruments including loans, guarantees, and technical assistance (e.g. Private Finance for Energy Efficiency (PF4EE);[95] the Smart Finance for Smart Buildings guarantee facility (under development);
- On-line EU mapping tool, to understand how public funds can be used to support energy efficiency in Europe (under development);
- Support to citizens' finance to energy efficiency through cooperation between local authorities and energy cooperatives. Such support is developed, among others, in Horizon 2020 projects: REScoop PLUS[96] and REScoop MECISE[97] with partners from across the EU. The REScoop MECISE project aims at launching at least € 30 million of renewable and energy efficiency investment including co-investment by citizens and local authorities. The project established a revolving fund to enable flexible pooling of project finance by the cooperatives. A number of guidance points for public authorities on how to support citizens' investment in local sustainable energy projects are presented in a "REScoop - Municipality Approach" paper;[98]
- Working on EU-wide quality standards on energy efficiency services such as through the project QUALITEE[99]: The project aims to scale up investment in building energy efficiency by establishing quality certification frameworks that go beyond the presentation of model contracts. It comprises standardised quality criteria, and an institutionalisation of the quality assurance process, as well as active promotion schemes. Ultimately, QualitEE aims to build trust in energy efficiency services and providers by fostering a common understanding of 'good quality' services and therefore, improve financeability of investment programmes.

7.8.4. guiding investments into an energy efficient public building stock;

- Assistance to facilitate the use of Energy Performance Contracts (e.g. EPC market facilitators; framework contract to simplify EPC procurement (UK), development of practical guides on EPCs, projects such as TRUST-EPC-South which set up a standardised approach allowing for risk assessment and benchmarking of energy efficiency investments upon an established real estate assessment tool (Green Rating™) or GuarantEE[100] which aims to bring innovative business and financing models for performance-based ESCO projects to a broader level addressing

[92] http://www.kredex.ee/en/apartment-association/
[93] https://www.kfw.de/inlandsfoerderung/Privatpersonen/Bestandsimmobilie/
[94] http://www.slovseff.eu/index.php/en/
[95] http://www.eib.org/en/products/blending/pf4ee/index.htm
[96] http://www.rescoop-ee.eu/rescoop-plus
[97] http://www.rescoop-mecise.eu/
[98] https://www.rescoop.eu/blog/rescoop-municipality-approach
[99] https://qualitee.eu/
[100] https://guarantee-project.eu/

complexer environments such as making EPC more flexible to better serve private sector clients or addressing rented facilities in 14 European countries.

- Initiatives to use Energy Performance Contracts and Energy Service Companies (ESCOs) for the renovation of public buildings (e.g. RE:FIT (UK),[101] EoL (SI),[102] 2020TOGETHER (IT),[103] PRODESA (EL),[104] RenoWatt (BE) – a partner of the H2020 Citynvest project.[105]

7.8.5. accessible and transparent advisory tools

- "One-stop-shop" approach or integrated service for the energy renovation of buildings (e.g. Energie Posit'If for the refurbishment of condominiums (France);[106] Picardie Pass Rénovation (France) [107] and Oktave[108] for the deep renovation of detached houses (France); for building refurbishment (REFURB, REIMARKT NL, Better home initiative in Denmark). The Innovate[109] project has carried out an analysis[110] of some of the best pilot models in Europe and the services they offer to homeowners.
- National Sustainable Energy Investment Platforms that organise dialogue with and between key stakeholders and e.g. develop roadmaps, propose improvements in the legal frameworks, develop and validate template documents and contracts etc., leading to a better understanding of the market (e.g. ENERINVEST (ES)[111]).
- General advisory services (e.g. FI-Compass, the European Investment Advisory Hub), technical guidance on financing the energy renovation of buildings with Cohesion policy funding.

Smart Finance for Smart Buildings *includes several initiatives at EU level which can support Member States in their efforts to set up and facilitate access to appropriate mechanisms to support the mobilisation of investments into building renovation:*

Sustainable Energy Investments Forums initiative: , a series of public events and national roundtables in EU Member States, specifically dedicated to energy efficiency finance. Their

[101] https://www.london.gov.uk/what-we-do/environment/energy/energy-buildings/refit/what-refit-london
[102] http://www.eib.org/attachments/documents/elena-completed-eol-en.pdf
[103] https://ec.europa.eu/energy/intelligent/projects/en/projects/2020together
[104] https://www.prodesa.eu/?lang=en
[105] http://www.gre-liege.be/renowatt/25/renowatt.html - a programme for the renovation of public buildings to enhance energy efficiency by grouping smaller projects to remove barriers that could be technical, legal, administrative and financial.
https://ec.europa.eu/energy/sites/ener/files/documents/012_a2_erika_honnay_seif_dublin_28-09-17.pdf
[106] http://www.energiespositif.fr/
[107] https://www.pass-renovation.picardie.fr/
[108] https://www.oktave.fr/
[109] http://www.financingbuildingrenovation.eu/
[110] Vesta Conseil and Finance (2018), Inventory of best practices for setting up integrated energy efficiency service package including access to long-term financing to homeowners
[111] https://www.enerinvest.es/en/

proceedings present a unique and rich collection of successful front-running initiatives throughout Europe, in particular for energy renovation of public and private buildings.
https://ec.europa.eu/energy/en/financing-energy-efficiency/sustainable-energy-investment-forums

ManagEnergy initiative: The 300+ energy agencies in the EU are important drivers and ambassadors for the local and regional energy transition: ManagEnergy supports them in their challenge, offering an in-depth training program on the fundamentals and best practices of energy efficiency finance in Europe today.
https://www.managenergy.eu

European Local ENergy Assistance (ELENA)
http://www.eib.org/en/products/advising/elena/index.htm

Horizon 2020: financing energy efficiency calls
The updated work programme for 2018-2020 can be found here:
http://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-energy_en.pdf

General advisory services (e.g. FI-Compass[112], the European Investment Advisory Hub[113]) can provide technical guidance on financing the energy renovation of buildings.

[112] https://www.fi-compass.eu/
[113] http://eiah.eib.org/

7.9. Indicators and Milestones

The Renovation Strategy Impact Framework being developed by Build Upon[114] may be a helpful tool in illustrating how an integrated set of targets, milestones and indicators could frame a long-term renovation strategy.[115]

7.10. Public consultation

The European Commission, in developing policy and legislation, relies on a transparent process, which involves citizens and stakeholders (for example, businesses, public administrations and researchers) throughout. Guidelines for the consultation of stakeholders have been developed and these may be useful for Member States in formulating their own process.[116]

The consultation requirements in the EPBD (in particular on the development) on the LTRS do not pre-empt any existing national obligations on public consultations. Since a substantial part of the implementation of EPBD will rely on local level initiatives and on the activation of private financing, the role of civil society, local level governments as well as the financial and investment sectors will be valuable, in addition to the contributions of the building and construction industries.

The following broad principles, adapted from the UK Government's guidance on consultation principles (and which presupposes a questionnaire-based approach),[117] could serve as useful guidelines for Member States in defining public consultation methodology for the development of their LTRS as well as for the monitoring of its implementation. As outlined in section 3.3 of this guidance, other less technical, face-to-face public consultation methodologies may also be helpful in achieving broad consensus on LTRS.

i. Consultations should be clear and concise

Be clear what questions you are asking and limit the number of questions to those that are necessary. Make them easy to understand and easy to answer. Avoid lengthy documents.

ii. Consultations should have a purpose

[114] BUILD UPON is an EU-funded collaborative project on building renovation which brings together governments and businesses, to NGOs and households from across 13 countries as a collaborative community to help design and implement national renovation strategies. www.buildupon.eu
It aims to create a renovation revolution across Europe by helping countries to deliver strategies for renovating their existing buildings. These strategies are critical to

[115] http://buildupon.eu/wp-content/uploads/2016/11/BUILD-UPON-Renovation-Strategies-Impact-Framework.pdf - Build Upon notes that this framework is not an attempt to set out a best practice set of targets and impact indicators, which is something that will require further work, but simply aims to frame the concept.

[116] https://ec.europa.eu/info/sites/info/files/better-regulation-guidelines-stakeholder-consultation.pdf

[117] https://www.gov.uk/government/publications/consultation-principles-guidance

Take consultation responses into account when taking policy forward. Consult about policies or implementation plans when the development of the policies or plans is at a formative stage. Do not ask questions about issues on which you already have a final view.

iii. Consultations should be informative

Give enough information to ensure that those consulted understand the issues and can give informed responses. Include validated impact assessments of the costs and benefits of the options being considered when possible.

iv. Consultations are only part of a process

Consider whether informal iterative consultation is appropriate, using new digital tools and open, collaborative approaches. Consultation is not just about formal documents and responses. It is an on-going process.

v. Consultations should last for a proportionate amount of time

Judge the length of the consultation on the basis of the nature and impact of the proposal. Consulting for too long will delay policy development. Consulting too quickly will not give enough time and will reduce the quality of responses.

vi. Consultations should be targeted

Consider the full range of stakeholders affected by the policy, and whether representative groups exist. Consider targeting specific groups if appropriate. Ensure they are aware of the consultation and can access it.

vii. Consultations should take account of the groups being consulted

Certain stakeholders may need more time to respond. When the consultation spans all or part of a holiday period, consider how this may affect consultation and take appropriate mitigating action, such as prior discussion with key interested parties or extension of the deadline.

viii. Consultations should be agreed before publication

Seek collective agreement before publishing a written consultation, particularly when consulting on new policy proposals.

ix. Consultation should facilitate scrutiny

Publish any response on the same page online as the original consultation. Explain the responses that have been received and how these have informed the policy. State how many responses have been received.

x. Responses to consultations should be published in a timely fashion

Publish responses within 12 weeks of the consultation or provide an explanation why this is not possible. Allow appropriate time between closing the consultation and implementing policy or legislation.

Few Member States have detailed the consultation process for their 2014 and 2017 LTRS. However, Finland provides good practice[118] of early involvement of relevant actors also to increase acceptance of jointly developed measures.

As the Finnish National Building Codes are developed, professionals and major organisations in the field are consulted and take an active part in the work, through preliminary studies and consultation forums. The proposals for national definitions and guidelines for NZEBs are being developed with active involvement of professional organisations from the construction industry, the building design and planning fields.

The involvement of professionals is also visible in the implementation of EPCs. Organisations in the building ownership as well as the building maintenance sectors are involved in both developing the national transposition and disseminating EPCs. Cooperation with the building and construction sectors and active involvement of field professionals has ensured that there is a high degree of compliance with the legislation – laws, decrees and building codes.

[118] https://ec.europa.eu/energy/sites/ener/files/documents/5_en_autre_document_travail_service_part1_v4.pdf