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Special Report

Energy efficiency in buildings: greater focus on cost-effectiveness still needed

EUROPEAN
COURT
OF AUDITORS

Contents

Annex

Annex I 2014-2020 Cohesion policy funds for energy efficiency in buildings

Glossary

Replies of the Commission

Audit team

Timeline

Executive summary

I Faced with the challenge of mitigating climate change, EU leaders have committed to saving 20 % of the EU Member States' projected energy consumption by 2020 and 32.5 % by 2030. Improving the energy efficiency of buildings is a key tool to achieving these targets. Buildings consume the greatest share of energy and have the largest energy savings potential.

II The latest assessment of the progress made by Member States towards the energy efficiency targets shows that the EU 2020 target is unlikely to be met, as EU energy consumption is rising again since 2014. We aim to issue recommendations that should help the EU to achieve its 2030 energy efficiency target by improving the cost-effectiveness of its 2021-2027 Cohesion policy spending.

III Collectively, Cohesion policy operational programmes allocated a budget of around €14 billion, equal to 4 % of all 2014-2020 Cohesion policy funds (€357 billion), to improve the energy efficiency of buildings, of which €4.6 billion for residential buildings. In addition, Member States budgeted €5.4 billion for national co-financing for all buildings, of which €2 billion for residential buildings.

IV We visited five Member States (Bulgaria, Czechia, Ireland, Italy (Puglia), Lithuania) that allocated some €2.9 billion of their Cohesion policy funds for energy efficiency in buildings. We assessed whether this budget was being used cost-effectively and whether the Commission and Member States had implemented recommendations from our special report 21/2012 on energy efficiency in public buildings.

V The Commission has issued extensive guidance for improving energy efficiency investments in buildings, including their cost-effectiveness, as we recommended in our special report 21/2012. We found examples of good practice: the use of financial instruments combined with grants and the modulation of the level of the aid rate to increase the leverage of private funding and reduce the risk of deadweight.

VI Member States required projects to be based on an energy audit, to deliver some levels of energy savings, and to improve the buildings' energy rating. In most cases, they allocated the budget to projects on a first-come first-served basis, which did not allow them to assess their relative costs and benefits. This meant they rarely prioritised projects delivering energy savings or other benefits at lower costs.

VII The monitoring system does not provide data on energy saved through spending EU funds on renovating residential buildings. This means that the Commission is unable to assess the EU budget's contribution to the EU energy efficiency target. No indicator measures the other benefits these investments may generate.

VIII As in our special report 21/2012, we conclude that cost-effectiveness is not guiding EU spending on energy efficiency in buildings. Better management, especially in the area of project selection, could lead to higher energy savings per euro invested.

IX Against a background of increased ambition for the EU energy efficiency targets and a perspective of tightening budgets, ensuring cost-effectiveness of the spending is more important than ever. On this basis, we issue the recommendations, which should help the EU to achieve its 2030 energy efficiency target by improving the cost-effectiveness of its 2021-2027 Cohesion policy spending. These cover planning and targeting investments; selecting projects delivering higher energy savings and other benefits at lower costs through assessing relative costs and benefits; using indicators to measure energy savings and other benefits, and rewarding measures that save energy in a cost-effective way.

Introduction

Energy Efficiency targets and progress

01 Improved energy efficiency means using less energy input for an equivalent level of output[1]. By using energy more efficiently EU citizens can lower their energy bills, help to protect their health and the environment and improve air quality.

02 Typical EU co-funded energy efficiency investments include additional insulation of buildings, energy-efficient windows, thermal control systems and upgrades of heating systems.

Figure 1 – Example of a renovated building (before and after energy efficiency works)

© Shutterstock / By PIXEL to the PEOPLE.

03 In 2012 Energy Efficiency Directive 2012/27/EU[2] incorporated the 20 % energy efficiency target for 2020 (compared to projected energy consumption in 2020). The

[1] Directive 2012/27/EU of the European Parliament and of the Council 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 (OJ L 315, 14.11.2012, p. 1). Article 2(4): The output could refer to performance, service, goods or energy.

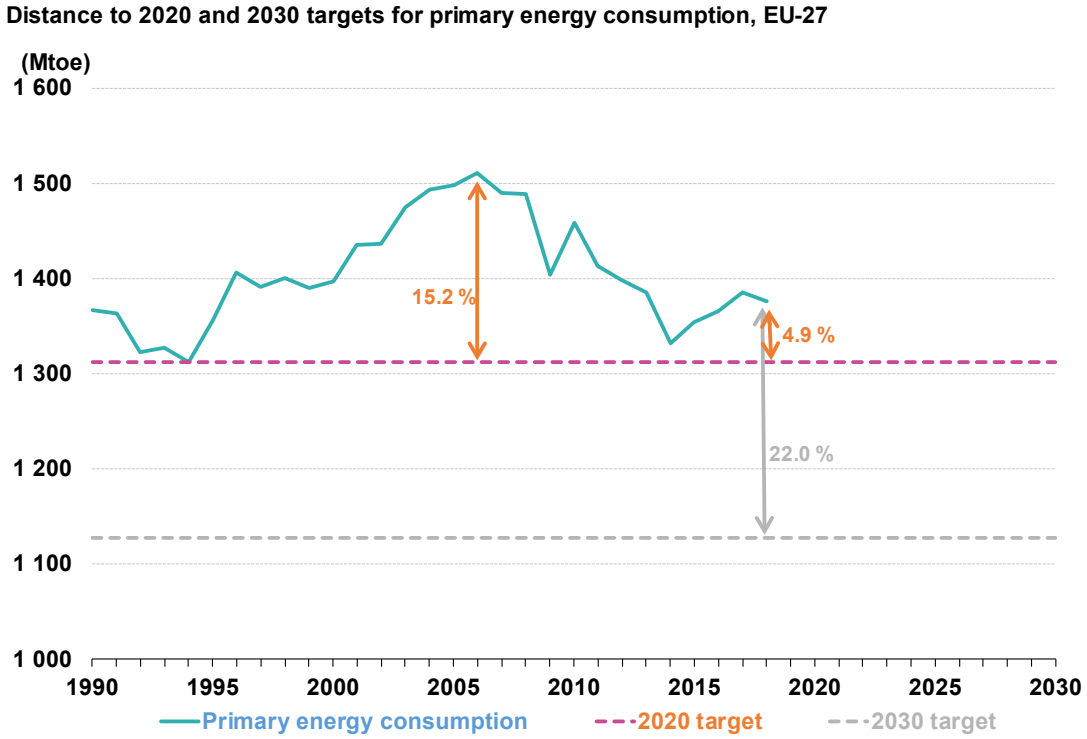
[2] Ibid.

revised Energy Efficiency Directive 2018/2002/EU[3] reflected the more ambitious headline EU energy efficiency target for 2030 of at least 32.5 %.

04 The new Commission has committed to applying the energy-efficiency-first principle with a focus on how the EU can further improve the energy performance of buildings and speed up renovation rates[4].

05 Data from Eurostat (February 2020) shows that in 2018 primary energy consumption in the EU Member States was 4.9 % above the 2020 targets (see ***Figure 2***):

Figure 2 – EU Member States' progress towards 2020 and 2030 energy efficiency targets (primary energy consumption)



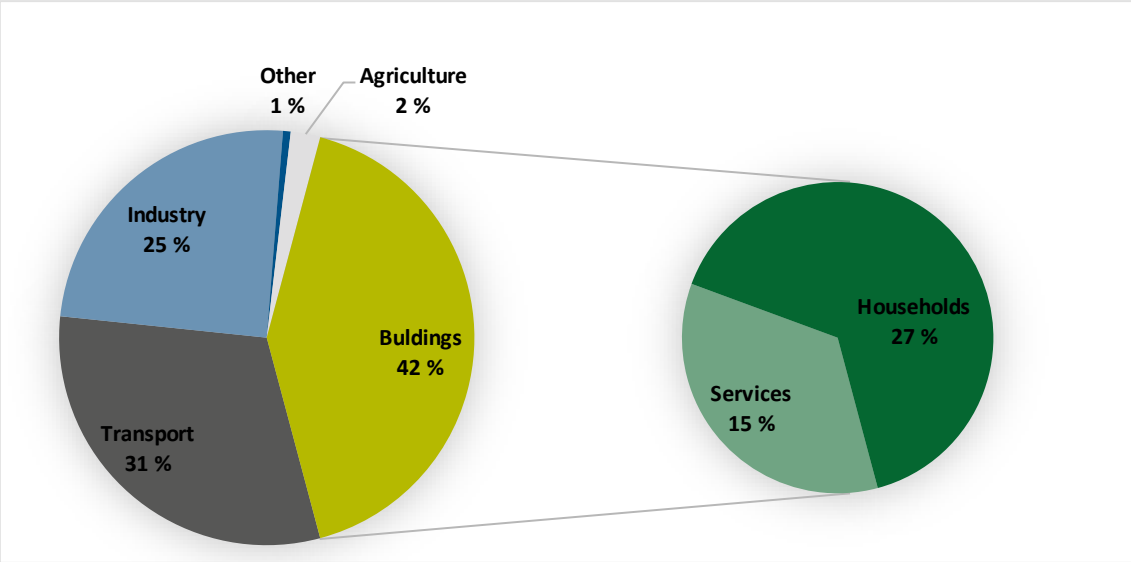
Source: Eurostat energy saving statistics Primary-Energy-Consumption-2018.

[3] Directive 2018/2002/EU of the European Parliament and of the Council of 11 December 2018 amending Directive 2012/27/EU on energy efficiency (OJ L 328, 21.12.2018, p. 210).

[4] The European Green Deal - Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions. COM(2019) 640 final of 11.12.2019.

06 The latest assessment on the progress made by Member States towards the energy efficiency targets shows that the EU 2020 target is unlikely to be met[5]. This trend makes the EU 2030 target of reducing energy consumption by at least 32.5 % even more difficult to achieve. Energy consumption should decrease especially in sectors with the biggest potential for energy savings, such as buildings. ***Figure 3*** provides a breakdown of the energy consumption by sector in the EU:

Figure 3 – 2017 Energy consumption by sector (% of total)



Source: ECA, based on Eurostat data on Final Energy consumption.

07 Buildings, in particular residential ones, have the greatest energy consumption in the EU, followed by the transport and industry sectors. It is also the sector with the biggest available energy savings potential in Europe[6]. In EU households, heating and hot water alone account for 79 % of total final energy use[7]. Energy savings from buildings' renovations typically derive from better insulation, heating and cooling systems, and lighting. While this report focuses on these types of investments, our

[5] Commission (2019) 224 final, "2018 assessment of the progress made by Member States towards the national energy efficiency targets for 2020 and towards the implementation of the Energy Efficiency Directive", as required by Article 24(3) of Directive 2012/27/EU.

[6] 2017 Commission "Good practice in energy efficiency" – Lessons learnt, p. 18 and COM SWD(2016) 408 final, "Evaluation of the Directive 2010/31/EU on the energy performance of buildings" p. 15.

[7] See https://ec.europa.eu/energy/en/topics/energy-efficiency/heating-and-cooling

recent special report 01/2020 focused on the EU minimum energy efficiency requirements and energy labels for appliances[8].

08 The Commission estimated that reaching the 2030 energy efficiency target would require investing some €282 billion per year in renovating the EU building stock[9]. If all budgeted EU Cohesion policy investments in public and residential buildings take place this would amount to around €2 billion per year in the period 2014-2020.

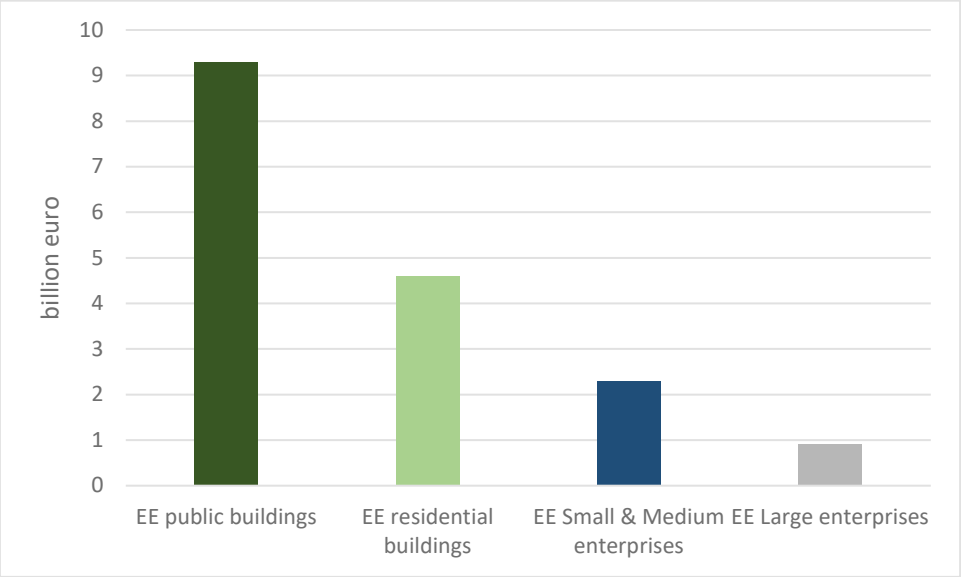
EU spending and legal framework

09 The 2014-2020 European Regional Development Fund and the Cohesion Fund planned €14 billion for investments in energy efficiency in public and residential buildings. Member States topped up these budgets with €5 billion of national co-financing. The breakdown of this budget per Member State is available in the ***Annex***. ***Figure 4*** shows the breakdown of the 2014-2020 EU Cohesion policy budget for energy efficiency investment.

[8] See special report 01/2020: "EU action on Ecodesign and Energy Labelling: important contribution to greater energy efficiency reduced by significant delays and non-compliance".

[9] Commission Staff Working Document (2016) 405 final, Impact assessment accompanying the Proposal for a Directive of the European Parliament and of the Council amending Directive 2012/27/EU on Energy Efficiency.

Figure 4 – Breakdown of 2014-2020 EU Cohesion policy budget for energy efficiency investments



Source: ECA.

10 The 2010 Energy Performance of Buildings Directive[10] contains several provisions to improve the energy efficiency of both new and existing buildings, such as:

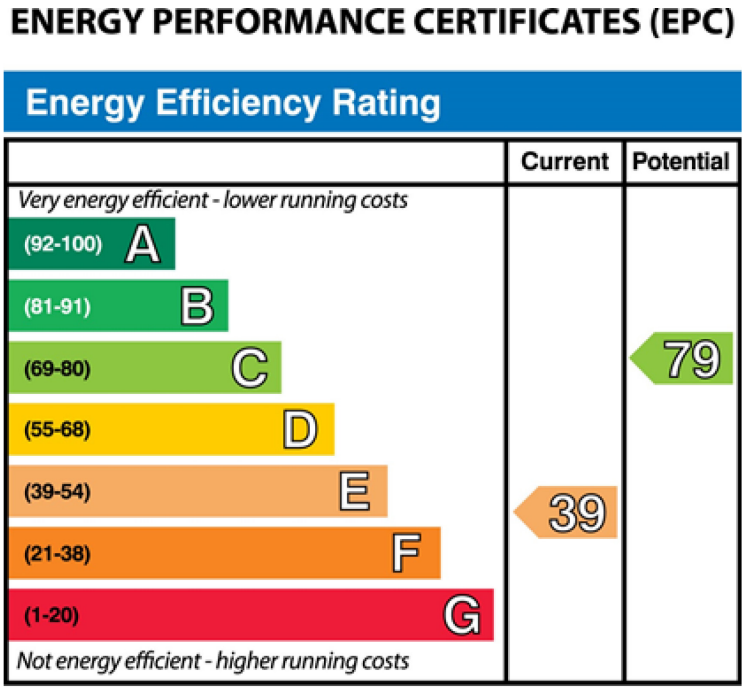
(a) minimum energy performance requirements for new buildings and major renovations of buildings;

(b) mandatory energy performance certificates accompanying the sale and rental of buildings, which state the current energy performance of a building, and recommend measures to improve its performance[11] (see example in ***Figure 5***).

[10] Directive 2010/31/EU of 19 May 2010 on the energy performance of buildings.

[11] Article 11 of Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings.

Figure 5 – Example of a building energy performance certificate



11 The 2012 Energy Efficiency Directive also contains provisions to improve the energy efficiency of buildings. These include Energy Efficiency Obligation Schemes, which place requirements on obligated parties, such as energy sales companies or distributors, to meet quantitative energy savings targets across their customer portfolio. The Impact Assessment of the revised Directive concluded that, by the end of 2016, they had contributed more energy savings (34 %) than any other single measure (voluntary agreements, taxation measures and financing schemes and incentives).

12 The 2012 Energy Efficiency Directive also required Member States to submit, every three years, their National Energy Efficiency Action Plans (NEEAPs) which shall cover significant energy efficiency improvement measures and expected and/or achieved energy savings. The Commission evaluates the NEEAPs and assesses the extent to which Member States have made progress towards achieving their national energy efficiency targets. The Commission sends its annual assessment to the European Parliament and the Council. Based on its assessment of the reports and the NEEAPs, the Commission may issue recommendations to Member States.

13 The National Energy and Climate Plans (NECPs) will replace NEEAPs. Member States have to submit these by the end of 2019 and they will be a key planning instrument for them. They will also play an important role to identify investment needs

in the field of energy efficiency. By 31 January 2020 18 out of 27 Member States had submitted their NECPs.

Shared management between Commission and Member States

14 Within the Commission, the Directorate-General for Energy develops and implements the EU energy policy. It formulates proposals to promote energy efficiency, supervises the implementation of the directives and monitors the Member States' progress towards energy targets with the help of the Joint Research Centre and the European Environmental Agency.

15 The Directorate-General for Regional and Urban Policy is responsible for managing the European Regional Development Fund (ERDF) and the Cohesion Fund (CF). It contributes to EU energy policy by providing funding and shares with Member States the responsibility for the efficiency and effectiveness of the programmes. In the 2014-2020 period it established guidelines for the content of partnership agreements and programmes and, after discussion with Member States, adopted them at the start of the financial period. Once they are in place, its main role is to monitor the implementation of these programmes, by participating in monitoring committees and receiving annual implementation reports. It is not involved in the selection of individual projects. Finally, it evaluates the results of the funding.

16 Member States set priorities in the energy efficiency field in the national legislation and in the NEEAPs based on their needs assessments. Member States prepare operational programmes and the designated managing authorities shall select projects using appropriate selection procedures and criteria, taking account of cost-effectiveness. In the 2014-2020 period, the Commission provided extensive guidance to managing authorities on how to design and implement their programmes (see ***Figure 6***). Managing authorities monitor project outputs and results based on performance indicators and report to the Commission on energy savings and other benefits delivered by operational programmes.

Audit scope and approach

17 Against a background of increased ambition for the EU energy efficiency targets and a perspective of tightening budgets, ensuring cost-effectiveness of the spending is more important than ever. This report aims to assess how cost-effectively EU co-funded energy efficiency investments in buildings are helping the EU to achieve its targets. We aim to issue recommendations that should help the EU to achieve its 2030 energy efficiency target by improving the cost-effectiveness of its 2021-2027 Cohesion policy spending.

18 The main audit question was whether EU co-funded energy efficiency investments in buildings were selected using criteria likely to maximise their cost-effectiveness. To answer this question, we examined whether the Commission and Member States set the right conditions for the selection of cost-effective investments (including needs assessment, targeting of the aid, performance framework), and Member States applied appropriate selection criteria.

19 We visited five Member States (Bulgaria, Czechia, Ireland, Italy (Puglia), Lithuania), selected on the basis of the amount they spent on energy efficiency and the aim to have a geographical balance. These Member States allocated some €2.9 billion of their 2014-2020 European Regional Development Fund and Cohesion Fund budget in this field.

20 Our audit work involved reviewing and assessing:

(a) national and regional needs assessments and national energy efficiency action plans,

(b) operational programmes, and project selection procedures,

(c) monitoring systems and project data on energy savings.

21 We focused on energy efficiency investments in residential buildings co-financed by the ERDF and CF. We assessed how these investments fit with EU energy efficiency policy. We also followed-up on our special report 21/2012 on energy efficiency in public buildings, at the Commission and in the three Member States we visited at the

time (Czechia, Italy and Lithuania), to assess to what extent the Commission and Member States implemented our recommendations from this report[12].

[12] See special report 21/2012: "Cost-effectiveness of cohesion policy investments in energy efficiency": www.eca.europa.eu/Lists/ECADocuments/SR12_21/SR12_21_EN.PDF

Observations

Improved Commission's guidance on needs assessment has had a limited impact on overall targeting

22 Partnership agreements and operational programmes allow a clear targeting of the investments when based on sound needs assessments, which include:

(a) an assessment of the energy consumption and the potential for energy savings in all sectors to identify the target building categories and beneficiaries;

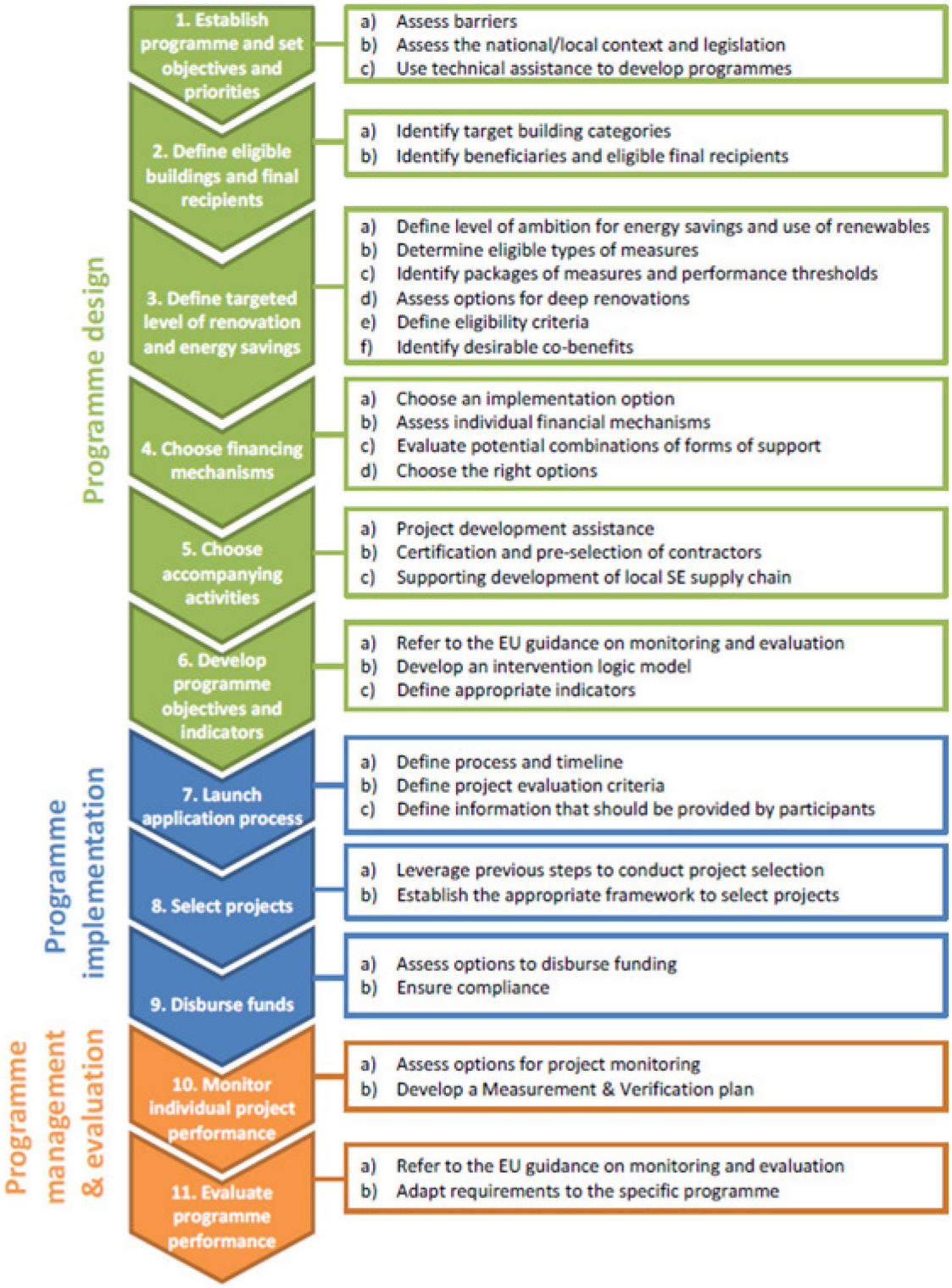
(b) an identification of the barriers to investments and areas needing further support included in the Member States' NEEAPs;

(c) an assessment of which form of support (e.g. grants or financial instruments) is best suited to address the identified needs and stimulate deep renovation.

The Member States we visited had not identified a clear basis for targeting EU funds

23 The Commission issued extensive guidance to Member States on how to assess their needs and design their programmes financing energy efficiency investments in buildings. ***Figure 6*** provides a roadmap of key steps the Commission recommended managing authorities to follow.

Figure 6 – Roadmap to implement a programme for financing energy renovation of buildings using Cohesion policy funding



Source: European Commission (2014), "Technical Guidance on Financing the energy renovation of buildings with Cohesion policy funding", p. 14.

24 All the five Member States we visited identified, in their partnership agreements and operational programmes, the need to increase the energy efficiency of their

building stocks, in particular residential buildings. Most of these planning documents referred to needs assessment included in the NEEAPs or other national energy strategic documents.

25 The five Member States did not include in their NEEAPs all the information recommended in the Commission's guidance note and template[13], such as the expected and achieved energy savings for each measure, including EU-funded ones. The 2012 Energy Efficiency Directive did not require Member States to put in place the measures included in their NEEAPs or to report the energy savings.

26 ***Table 1*** provides an overview of the main elements of the needs assessments for the five operational programmes we examined:

Table 1 – Main elements of the needs assessments for the five operational programmes we examined

Operational programme	Was there a classification of buildings by energy consumption?	Were potential energy savings and investments needs quantified?	Was there a clear justification for using EU funds?
Bulgaria Regions in Growth	No	No	Yes
Czechia Integrated Regional	No	No	Yes
Ireland Southern & Eastern Regional	Yes	Yes	No (see ***Box 1***)
Italy (Puglia) Regional	No	No	Yes
Lithuania Investment for growth and jobs	Yes	Yes	Yes

Source: ECA.

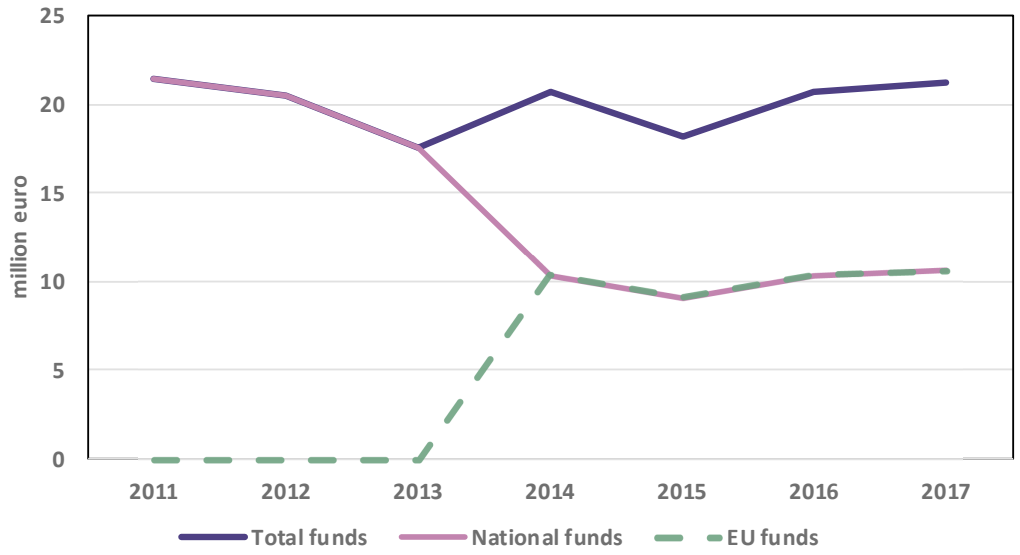
[13] COM(2013) 762 final: Implementing the Energy Efficiency Directive – Commission Guidance and SWD(2013) 180 final: Guidance for National Energy Efficiency Action Plans, sections 3.2.4 and 3.2.5.

Box 1

In Ireland the use of EU funds on a previously nationally funded scheme did not lead to a scale-up in energy efficiency

Since 2000 Ireland has had in place a nationally-funded "Better Energy Warmer Homes Scheme", targeting low-income households at risk of energy poverty, i.e. unable to afford proper heating. When in 2014, EU funds started to co-finance this scheme, Ireland reduced national funding for the scheme so that the total funding allocated to the scheme remains stable at around €20 million per year (see ***Figure 7***). This use of EU funds is not consistent with a significant scale-up or acceleration of investments in energy efficiency, but essentially substituted national funding.

Figure 7 – Funding allocation to the Better Energy Warmer Homes Scheme in Ireland over time (2011-2017 period)



Source: ECA.

27 For Czechia and Italy (Puglia) these findings are similar to those reported in our special report 21/2012, where we observed that 2007-2013 operational programmes had not benefited from proper needs assessments. Those assessments did not identify the specific sectors where energy savings could be achieved and the options for achieving those savings in a cost-effective manner, thereby justifying the chosen measures and their cost.

28 On this basis, we recommended the Commission make 2014-2020 Cohesion policy funding subject to the establishment of a proper needs assessment at

programme level. However, three (Bulgaria, Czechia and Italy (Puglia)) of the five Member States we visited in 2019 still did not base their operational programmes on a robust assessment of energy consumption nor quantify potential energy savings and corresponding investments needs. In Lithuania the situation has improved as national authorities now quantify investment needs and potential energy savings.

Member States are aware of barriers to investment, which have not been addressed

29 Energy efficiency improvements generate significant reductions in energy bills but many energy efficiency investments in buildings do not happen due to market barriers[14]. These include lack of awareness and expertise on energy efficiency financing and benefits, high initial costs, regulatory barriers in multi-ownership buildings (often requiring unanimity for housing associations), and the split incentive or owner/tenant dilemma[15]. This refers to a situation where the building owner pays for the energy efficiency upgrades but is unable to recover savings from reduced energy use that accrue to the tenant. As a result, the owner may have little incentive to invest in energy efficiency improvements.

30 In Bulgaria, Czechia and Lithuania, managing authorities and project beneficiaries told us that difficulty in reaching agreement in multi-ownership buildings was a key obstacle to improving energy efficiency.

31 Other barriers, hindering in particular the take up of Energy Performance Contracting mechanisms, relate to public procurement rules, as there is legal uncertainty on the essential elements of such contracts and difficulties in distinguishing between works, supply and services[16], and on recording these contracts in public sectors' national accounts. The Commission is working on lifting these barriers: in 2017 Eurostat published a guidance note[17] clarifying how to record these contracts in national accounts. This note was complemented in 2018 by further guidance prepared together with the EIB[18].

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[14] Commission (2017): "Good practice in energy efficiency" p. 15.

[15] JRC report (2014), "Overcoming the split incentive barrier in the building sector".

[16] Italian Energy National Agency: ENEA (2017): "The Energy Performance Contracts".

[17] Commission (2017) "Eurostat Guidance note: the recording of energy performance contracts in government accounts".

[18] https://www.eib.org/attachments/pj/guide_to_statistical_treatment_of_epcs_en.pdf

32 None of the five operational programmes we examined described the barriers hampering energy efficiency investments in their territory and the measures taken to overcome them. However, two of the five Member States we visited reported specific initiatives to lift some barriers:

- Lithuania decided that a simple majority of the owners could agree on energy efficiency upgrades in multi-apartment buildings, and provided 100 % public support for upgrades for low-income people (see ***Box 2***);
- in 2018, Czechia started to allow housing cooperatives to apply for EU funding for energy efficiency investments and in 2019 started a national publicity campaign to raise awareness about energy efficiency financing.

Grants remain the main form of support for energy efficiency investments funded by the EU and are not reserved for deep renovation

33 Energy efficiency investments generate benefits for both owners (an increase in value) and the occupants (a reduction in energy costs). Before using significant levels of grant support, Member States should consider using financial instruments and innovative market mechanisms such as energy performance contracting and Energy Efficiency Obligation Schemes.

34 The €4.6 billion of investments selected by Member States in energy efficiency renovation of residential buildings will be financed 72 % through grants and 28 % through financial instruments.

35 All five Member States we visited mentioned in their partnership agreements the intention to explore the use of financial instruments to support energy efficiency investments in buildings. However, so far only Lithuania has used EU funds to put in place such an instrument for residential buildings (see ***Box 2***).

Box 2

Good practice – Lithuania using financial instruments for energy efficiency upgrades to multi-apartment buildings

Drawing on the 2007-2013 positive experience in using financial instruments for such investments, in the 2014-2020 period Lithuania set up a financial instrument providing preferential loans for €314 million to housing associations. It is used for the renovation of some 4 000 multi-apartment buildings which is the objective of the national programme for the energy renovation of residential buildings, which started in 2004.

Loans are provided over an average 20-years payback period with a 3 % fixed interest rate. Loans are blended with a grant, from national funds, which ranged over time between 15 % up to 40 % of the loan amount. For low-income households, the grant covers 100 % of the investment.

36 The Commission recommended Member States to use EU Cohesion policy funding, especially when provided as grants, to support primarily deep renovation going beyond minimum energy performance requirements and resulting in significant energy savings (typically more than 60 %[19]).

37 ***Table 2*** provides an overview of the types of beneficiaries, forms of support and public aid rates used under the five operational programmes we examined:

Table 2 – Type of beneficiaries, forms of support and public aid rates for the five operational programmes we examined

Operational programme	Type of beneficiaries	Form of support	Public aid rate
Bulgaria Regions in Growth	Private owners	Grant	100 %
Czechia Integrated Regional	Private owners	Grant	30 % or 40 % (depending on energy savings)
Ireland Southern &	Public and private owners	Grant	100 %

[19] See 2010 Energy Performance of Buildings Directive and COM(2013) 225 final "Financial support for energy efficiency in buildings".

Eastern Regional			
Italy (Puglia) Regional	Public entities	Grant	100 % (or 90 % for beneficiaries co-financing 10 % of the project)
Lithuania Investment for growth and jobs	Private owners	Loans combined with grants	15 % - 40 % grant 100 % grant for low-income households

Source: ECA based on data provided by visited managing authorities.

38 The use of different rates of public aid in Lithuania is a good practice to increase the leverage of private funding and reduce the risk of deadweight. Through this modulation, higher grant aid rates are provided for projects involving greater energy savings, the installation of individual meters, and for low-income households (which helps to address energy poverty).

39 In Czechia only one quarter of beneficiaries submitted projects eligible for the 40 % public aid rate, which required at least 40 % energy savings and a "B" energy rating after works. Three quarters of beneficiaries submitted projects eligible for the lower (30 %) public aid rate, which required only 20 % energy savings. Beneficiaries perceived the incremental benefit of the higher aid rate as insufficient to offset for the higher costs of the deeper renovation projects.

40 Bulgaria, Ireland and Italy (Puglia) did not modulate the public aid rate to stimulate deeper renovations or to take into account the extent or complexity of the investments, but only – in case of Italy (Puglia) – the willingness of public entities to finance 10 % of the investment. Ireland explained this is because one of the two EU co-funded schemes targets elderly and vulnerable people at risk of energy poverty.

41 The lack of aid modulation implies financing with very high public aid rate even simple upgrades (e.g. lighting upgrades, boiler replacements) with quick payback times and modest unit costs. ***Box 3*** provides examples of two operational programmes targeting "low-hanging fruit" energy efficiency upgrades.

Box 3

Examples of operational programmes targeting "low-hanging fruit" energy efficiency upgrades

In Ireland, the "Better Energy Warmer Homes Scheme" financed with a 100 % public aid rate projects involving mainly simple upgrades (dry lining, attic insulation, lagging jackets for hot water tanks and cavity wall insulation). Upgrades of this kind are relatively cheap (the average cost of projects funded in the 2014-2017 period was €3 161) and generally have quick payback times. However, the energy rating of most of the supported households did not improve after the project (see paragraph ***85***), confirming that the investments did not yield much in terms of energy savings.

In Italy, the 2007-2013 interregional operational programme for energy – that we examined to follow-up our special report 21/2012 – supported energy efficiency projects in Campania, Calabria, Puglia and Sicily. Its 2014 and 2015 calls for projects financed with 100 % aid rate only pre-selected simple upgrades, typically purchasing and installing LED bulbs and heat pumps. This choice allowed authorities to spend quickly the remaining budget before the closing date of 31 December 2015. It also led to, on average, a rapid payback time of investments. However, the choice also entailed a high risk of deadweight, i.e. of funding business-as-usual upgrades that would have happened even in the absence of EU funding.

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42 These "low-hanging fruit" upgrades may result in the "lock-in effect", which refers to the fact that once some basic energy efficiency measures have been implemented, it becomes less cost-effective to fit more comprehensive measures in

the future[20]. This can reduce the potential that the building stock has to play in saving energy in the medium and long-term, since the number of renovations that a household can carry out is usually limited to one or maximum two. The need for public aid, especially in the form of grants with a 100 % aid rate, is thus less appropriate for simple upgrades than for deeper renovations. Since simple upgrades with quick payback times are usually financially viable, they should have been financed without public support, or using financial instruments.

Project selection not sufficiently driven by cost-effectiveness rationale

43 Cost-effectiveness should be a major determinant of public spending decisions, especially when it concerns energy efficiency projects: comparing the costs and benefits of the investments allows choosing the ones offering greater energy savings and other benefits per euro invested, in accordance with the principles of economy, efficiency and effectiveness set out in Article 33 of the Financial Regulation[21]. The Impact Assessment for the proposed Energy Efficiency Directive argued that the objective of saving 20 % of the EU's projected energy consumption by 2020 could be achieved by introducing cost-effective measures. Member States should put in place measures to stimulate cost-effective, deep renovation of buildings[22].

44 The Commission gave guidance to Member States to apply selection criteria that prioritise more cost-effective projects[23]. This should be done by:

(a) requiring projects to be based on an energy audit and/or energy performance certificate. These should identify and quantify cost-effective energy savings opportunities and allow monitoring and verifying the project's actual energy savings;

(b) setting minimum and/or maximum thresholds for key parameters, such as the quantity of energy to be saved, the minimum energy rating the building should

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[20] See Commission (2014), "Technical Guidance on Financing the energy renovation of buildings with Cohesion policy funding", p. 45.

[21] Financial Regulation EU/EURATOM 2018/1046 of 18 July 2018.

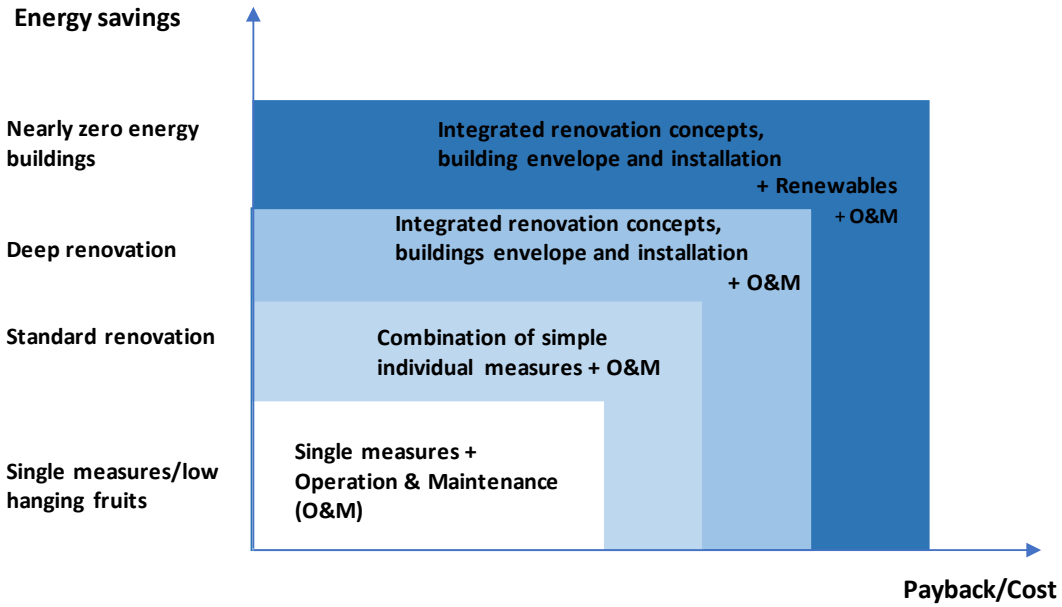
[22] Article 4 of Energy Efficiency Directive 2012/27/EU.

[23] Commission (2014), "Technical Guidance on Financing the energy renovation of buildings with Cohesion policy funding".

achieve, the net present value, the simple payback time[24], the cost per unit of energy saved. These thresholds should minimise the risk of funding very simple measures likely to happen anyway (e.g. lighting replacements, which get typically repaid very quickly) as well as investments too costly for the energy savings they generate (e.g. with payback times longer than the useful life of the materials used). ***Figure 8*** provides a categorization of energy efficiency investments, showing that more complex and ambitious renovations usually entail greater costs and payback times;

(c) assess the relative costs and benefits of projects, including co-benefits and externalities (e.g. health, social cohesion, urban rehabilitation, growth and jobs, reduction of air pollution and climate change, savings in public budget …) energy efficiency investments should generate, and prioritise projects that contribute in the most cost-effective way to the policy objectives.

Figure 8 – Categorization of energy efficiency investments



Source: European Commission (2014), "Technical Guidance on Financing the energy renovation of buildings with Cohesion policy funding", p. 46.

[24] The simple payback time is one of the evaluation methods for cost-effectiveness, indicated in the Commission (2014), "Technical Guidance on Financing the energy renovation of buildings with Cohesion policy funding". It measures the time needed for accumulated savings generated by the project to get back the initial investment.

Energy audits and performance certificates form a good basis for evaluating investments

45 All five Member States we visited required projects to be based on an energy audit, an energy performance certificate or, at least, an energy assessment (in Ireland, this did not result in issuing a certificate stating the household's pre-works energy class). This represents a clear improvement, compared to the findings of our special report 21/2012, where we reported that in Czechia, Italy and Lithuania energy audits were not yet a common practice. At the time we concluded that energy audits were not always obligatory or of good quality[25] and we recommended that energy audits should be used as the primary selection requirements.

46 In all five Member States we visited, beneficiaries had to provide a post-works energy performance certificate, stating the new energy class and energy consumption of the renovated household or building. The difference in the energy consumption stated in the pre- and post-works certificates provides an estimation of the energy saved thanks to the project.

47 In Italy (Puglia) the managing authority required projects to install systems to monitor the quantity of energy actually produced and consumed in the buildings. In Lithuania, the grant aid rate, which complements EU co-funded loans, was increased for projects including the installation of individual meters in households (see paragraph ***38***).

48 Despite their limitations, estimates based on the difference in energy consumption stated in the pre- and post-works certificates provide an easy-to-collect figure of energy saved per project. This figure can be compared to the project cost to calculate an estimated cost per unit of energy saved. In our special report 21/2012 we recommended the Commission to monitor the cost-effectiveness of the operational programmes on the basis of the cost per unit of energy saved[26]. However, the Commission did not fully agree to our recommendation and did not implement it.

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[25] See our special report 21/2012 paragraphs 41 to 44.

[26] See special report 21/2012, recommendation 2.

National authorities select projects expected to save energy, but sometimes at high cost

49 *Table 3* provides an overview of the minimum energy efficiency requirements and on the maximum thresholds for the cost per unit of energy saved for projects under the five operational programmes we examined:

Table 3 – Minimum energy efficiency requirements and maximum thresholds for the cost per unit of energy saved for the five operational programmes we examined

Operational programme	Minimum energy rating after works	Minimum energy savings after works	Maximum cost per unit of energy saved?
Bulgaria Regions in Growth	C	60 % for deep renovations, no minimum otherwise	No, only cost ceilings per square metre
Czechia Integrated Regional	No	20 % for projects receiving 30 % grant aid rate	No, but high private co-financing (60-70 %) reduces risk of gold-plating
	C	30 % for projects receiving 30 % grant aid rate	
	B	40 % for projects receiving 40 % grant aid rate	
Ireland Southern & Eastern Regional	Minimum one energy rating improvement	No requirement	No
Italy (Puglia) Regional	C	10 % (or 30 % to get best score)	No
Lithuania Investment for growth and jobs	D	20 % for projects receiving 15 % grant aid rate (until 2017)	No, but high private co-financing (60-85 %) reduces risk of gold-plating
	C	40 % for projects receiving 40 % grant aid rate (until 31/10/2017) and 30 % grant aid rate (from 1/11/2017)	

Source: ECA based on information received by managing authorities.

50 In Bulgaria, Czechia, Italy and Lithuania, these minimum energy efficiency requirements after works ensured projects with a minimum level of ambition[27]. This is a positive development compared to the findings of our previous audit.

51 However, the absence of ceilings for the cost per unit of energy entails a risk of financing projects that generate low energy savings in proportion to their costs. This implies that the financial savings on energy bills generated by the projects may be insufficient to repay the initial investments within the lifetime of the materials used (typically 30 years[28]).

52 This risk is lower when beneficiaries co-finance a high share of project costs, e.g. in Czechia and Lithuania, and greater when public support is very high, i.e. in Bulgaria, Ireland and Italy (Puglia). ***Table 4*** provides an overview of the average simple payback time of supported energy efficiency investments under the operational programmes we examined.

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[27] In line with European Commission (2014), "Technical Guidance on Financing the energy renovation of buildings with Cohesion policy funding", p. 55, recommending managing authorities to require projects to increase energy rating by at least two or three levels to be eligible, to avoid picking "low-hanging fruit".

[28] Based on the provisions of EU Directive 2010/31/EC and European Standard EN 15459:2007.

Table 4 – Average simple payback time of supported energy efficiency investments for the five operational programmes we examined

Operational programme	Average simple payback time of supported projects
Bulgaria Regions in Growth	Not available (as data on energy saved are not collected)
Czechia Integrated Regional	9 years
Ireland Southern & Eastern Regional	Not available (as data on energy saved are not collected)
Italy (Puglia) Regional	24 years
Lithuania Investment for growth and jobs	11 years

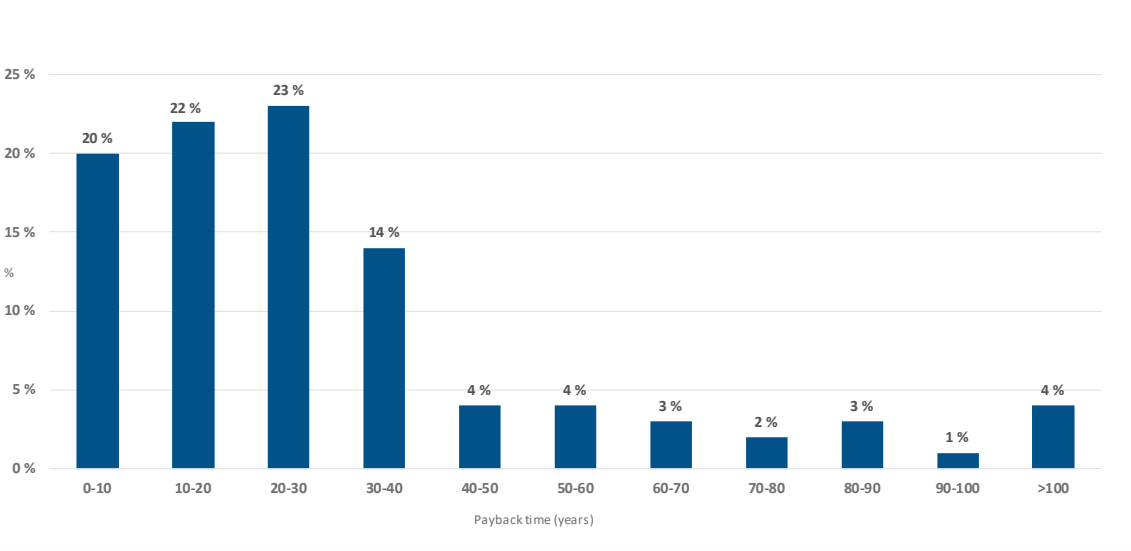
Source: ECA based on data provided by visited managing authorities, applying the electricity price for household consumers in 2018 (https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Electricity_price_statistics).

53 The average simple payback period for the energy efficiency projects of the operational programmes we examined ranged between 9 and 24 years. These periods are longer than the simple average of 7 years for the 5 152 projects recorded in the De-risking Energy Efficiency Platform. This platform contains data provided by public and private investment funds and financial institutions, national and regional authorities, as well as energy efficiency solution providers across the EU[29]. The Commission created this platform to up-scale energy efficiency investments in the EU through sharing data and analysis of completed projects.

54 In Italy (Puglia), the absence of a ceiling on the cost per unit of energy saved led to the financing of several expensive projects, which will save too little energy to repay their high initial investment costs within the lifetime of the materials used or of the buildings themselves. As shown in the following graph, 35 % of projects are not likely to repay their initial investment cost within 30 years.

[29] See https://deep.eefig.eu/

Figure 9 – Breakdown of energy efficiency projects under Italy (Puglia) operation programme by payback time



Source: ECA based on data provided by visited managing authorities and applying the electricity price for household consumers in 2018 (https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Electricity_price_statistics).

55 In Bulgaria and Ireland, the lack of monitoring data on energy saved by projects in residential buildings means it is impossible to assess the cost-effectiveness of the investments.

56 In Ireland, the Southern & Eastern Regional Operational Programme aimed to support "comprehensive and ambitious energy efficiency improvements resulting in at least an improvement in one energy efficiency rating"[30]. In practice, projects did not define any energy saving objective, did not report on energy saved and, for more than half of supported households, did not improve energy ratings (see paragraph ***85***).

57 These findings are similar to those reported in our special report 21/2012, where we concluded that energy efficiency projects in public buildings were often too costly for the energy they saved and had overly long payback times (on average around 50 years)[31]. On this basis, we recommended the Commission set a maximum acceptable simple payback time and a standard investment cost per unit of energy to be saved when selecting projects.

[30] See section 4(c) of 2014-2020 Irish Southern and Eastern Regional Operational Programme.

[31] See special report 21/2012 paragraph 52(a).

58 The Commission "Technical Guidance on Financing the energy renovation of buildings with Cohesion policy funding" indicates that "a maximum and/or minimum payback time can be defined for projects that are eligible for funding; however this might result in a lock-in effect with low hanging fruits being financed in priority"[32]. However, in practice, none of the visited managing authorities had set such thresholds.

Selection criteria still not prioritising most cost-effective projects

59 *Table 5* provides an overview of the project selection procedures, main budget allocation and project selection criteria used under the five operational programmes we examined:

Table 5 – Project selection procedures and criteria for the five operational programmes we examined

Operational programme	Project selection procedure	Main budget allocation criteria	Main project selection criteria
Bulgaria Regions in Growth	Open calls (92 % of the budget)	Municipalities select buildings based on age, number of households, location ..., not based on cost-effectiveness of energy savings	For open calls no criteria related to cost-effectiveness of energy savings
	Competitive call (8 % of the budget)		For 2018 call of Axis 2 criteria awarding most points related to cost-effectiveness of energy savings
Czechia Integrated Regional	Open calls	Country-wide open calls	No criteria related to cost-effectiveness of energy savings
Ireland Southern & Eastern Regional	Open calls	Budget allocated to local authorities based on number of requests received, not based on cost-effectiveness of energy savings	No criteria related to cost-effectiveness of energy savings

[32] Commission (2014), "Technical Guidance on financing the energy renovation of buildings with Cohesion Policy funding", p. 54.

Italy (Puglia) Regional	Competitive call	Competitive call	Criteria awarding most points (65 out of 100) related to energy savings
Lithuania Investment for growth and jobs	Open calls	Open calls	No criteria related to cost-effectiveness of energy savings

Source: ECA, based on data provided by visited managing authorities.

60 Except for Italy (Puglia) and for a minor call (8 % of the budget) in Bulgaria, in practice the managing authorities we visited allocated the budget to energy efficiency projects in residential buildings using open calls, i.e. on a first-come first-served basis. This allowed managing authorities to have continuous applications and, generally, quick processing times.

61 However, the use of such open call procedures does not allow assessment of the relative costs and benefits of projects. These include the cost-effectiveness of the energy savings and also co-benefits energy efficiency investments should generate (e.g. health improvements, urban rehabilitation, and reductions in energy poverty, energy bills, climate change, air pollution). As a result, projects delivering higher energy savings or other benefits at lower costs were not prioritised.

62 Only Italy (Puglia) used a competitive call to assess the relative cost-effectiveness of energy efficiency projects (see ***Box 4***).

Box 4

Example of an operational programme using a competitive call to assess the relative cost-effectiveness of energy efficiency projects

In Italy (Puglia), the managing authority used a competitive call, and applied one criterion related to cost-effectiveness of energy savings, which should have allowed prioritising projects savings more energy at lower cost. However, this did not prevent funding also projects delivering low energy savings in proportion to their cost. This is due to the absence of a ceiling on the cost per unit of energy saved (see paragraph ***53***) and the low weight this criterion had in practice (3 % instead of the 20 % of points available in the calls were awarded under this criterion). This was because the most cost-effective project, which was used as a basis for determining the score of the other projects, was an outlier (as it involved only simple measures like solar panels, heat pumps, thermostatic valves). As a result, almost all (95 %) other projects got a very similar score (between 0 and 5 points out of 20), which prevented making an actual prioritization. As a comparison, in the calls under the Italian nationally funded Programme for the Regeneration of Central Public Administration buildings this criterion accounts for 60 % of the points that can be awarded to a project.

63 These findings are similar to those reported in our special report 21/2012, where we concluded[33] that cost-effectiveness was not a determining factor when Member States allocated funding to energy efficiency measures and projects. On this basis, we recommended the use of project selection criteria based on standard investment costs per unit of energy to be saved.

64 The "Technical Guidance on Financing the energy renovation of buildings with Cohesion policy funding" published by the Commission states that "Member States must use criteria to determine which energy efficiency projects are most cost-effective and should be prioritised for selection"[34]. However, the current findings show that this has, to a large extent, not been implemented.

[33] See special report 21/2012 paragraph 51(b).

[34] Commission (2014), "Technical Guidance on Financing the energy renovation of buildings with Cohesion Policy funding", p. 54.

A weak performance framework

65 Performance information on energy efficiency spending should demonstrate what has been achieved with the EU budget and show that it has been spent well (accountability)[35]. This information should show that Member States selected cost-effective projects.

66 To ensure the result orientation of the spending, Commission guidance[36] is that the performance framework should include:

(a) specific, measurable, achievable, relevant and timed objectives for each operational programme, defining how the EU co-funded measures contribute to the EU energy efficiency targets;

(b) indicators allowing monitoring the physical output and results of the projects. As the main aim of the audited spending is to save energy, these indicators should report primarily on the amount of energy saved and, possibly, on other results generated by projects. The monitoring system should allow aggregating such data to report on energy saved by operational programmes and, thus, on EU budget's contribution to the EU energy efficiency targets;

(c) *ex ante* conditionalities, to ensure that the necessary conditions for an effective and efficient spending are in place, and a performance reserve, for rewarding operational programmes that can show generating energy savings cost-effectively.

Common indicators measure the energy saved by investments in public but not in residential buildings

67 All five operational programmes we examined defined specific objectives for their energy efficiency actions, based on the need to increase the energy efficiency of their buildings stock, in particular residential buildings (see paragraph ***24***). Objectives are relevant to the headline EU energy efficiency target and time-bound (as results should be achieved by 2023). However, none of the operational programmes we examined

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[35] In line with the principle of sound financial management set in Financial Regulation EU/EURATOM 2018/1046 of 18 July 2018, Article 33.

[36] Commission (2014), "Guidance for Member States on performance framework, review and reserve" and Commission (2014), "Guidance on ex-ante conditionalities".

defined the expected amount of energy savings the investments should deliver or the expected cost per unit of energy saved.

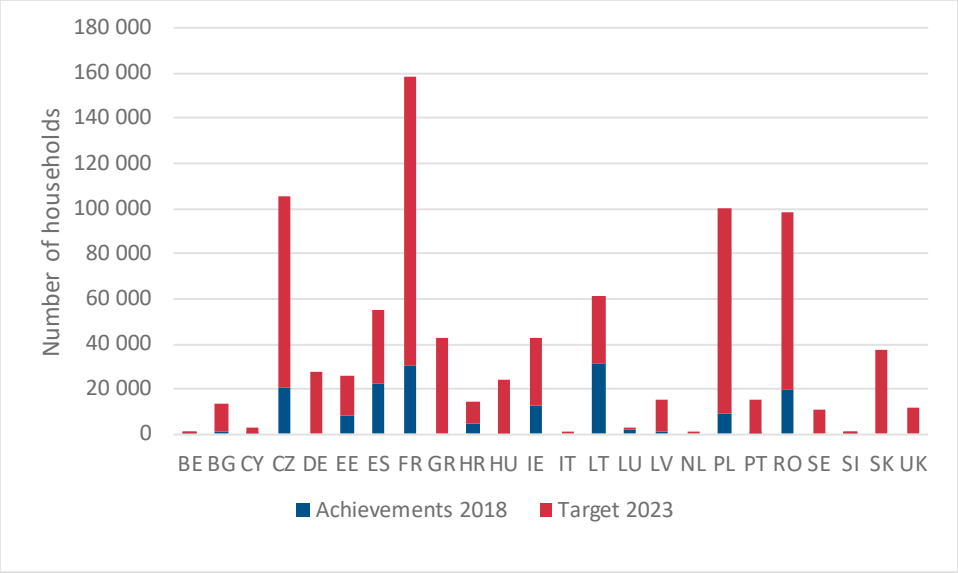
68 The Fund-specific regulations[37] establish a list of common output indicators that Member States should use wherever the indicator is relevant to express the output of the supported investment. The two common output indicators relevant to energy efficiency spending in buildings are:

(a) Common output indicator 31 "Number of households with improved energy consumption classification", which relates to spending for the energy efficiency renovation of residential buildings;

(b) Common output indicator 32 "Decrease of annual primary energy consumption of public buildings", which measures energy saved by spending mainly for the energy efficiency renovation of public buildings.

69 ***Figure 10*** and ***Figure 11*** show the progress made by 2018 against the target value for 2023 for the common output indicators 31 and 32.

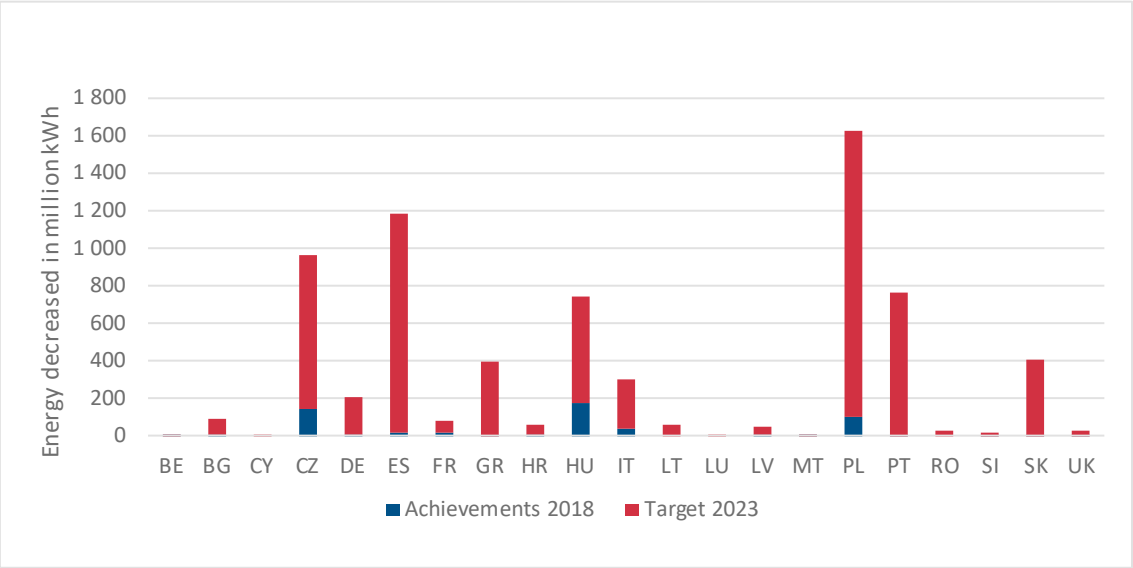
Figure 10 – Common Output Indicator 31 "Number of households with improved energy consumption classification"



Source: ECA, based on European Commission data.

[37] Article 5 and Annex I of Regulation (EU) No 1300/2013 on the Cohesion Fund. Article 6 and Annex I of Regulation (EU) No 1301/2013 on the ERDF.

Figure 11 – Common Output Indicator 32 "Decrease of annual primary energy consumption of public buildings"



Source: ECA, based on European Commission data.

70 For energy efficiency investments in **public** buildings, Common Output Indicator 32 reports on the energy saved. But, for energy efficiency investments in **residential** buildings, Common Output Indicator 31 reports on the number of households with an improved energy rating, not on the energy saved.

71 Since there is no common indicator reporting on the amount of energy saved by investments in residential buildings, it is not possible to know how much energy will be saved by investing the planned €4.6 billion[38] of the 2014-2020 EU budget inenergy efficiency investments in residential buildings. It is also not possible to quantify the whole of the EU budget's contribution to the EU energy efficiency targets.

72 These findings are similar to those in our special report 21/2012, where we concluded[39] that performance indicators for energy efficiency measures were not appropriate for monitoring programmes and the results of energy efficiency measures across the EU could not be aggregated. On this basis, we recommended using comparable performance indicators across the EU. The Commission partially implemented this recommendation by introducing, for the 2014-2020 period, the Common Output Indicator 32, reporting on energy saved by EU funded investments, but only for public buildings. For the 2021-2027 period, the Commission has proposed

[38] This is the budget allocated by Member States at 31 January 2020.

[39] See special report 21/2012 paragraph 51(c).

common result indicator RCR26 “Annual final energy consumption (of which: residential, private non-residential, public non-residential)”.

73 In addition to common output indicators, the five operational programmes we examined used the following programme specific indicators, which should be targeted to the specific investments they support:

Table 6 – Programme specific indicators for the five operational programmes we examined

Operational programme	Indicator	Measurement unit	Baseline in 2013	Value in 2018 (or latest reported)	Progress
Bulgaria Regions in Growth	Final energy consumption from households	(in 1 000 toe*)	2 257	2 319	-
	Final energy consumption by public administration, trade and services	(in 1 000 toe)	964	1 200	- -
Czechia Integrated Regional	Final households’ energy consumption	MWh/year	70 027 778	80 497 553	- -
Ireland Southern & Eastern Regional	The average thermal performance of housing units in the S&E Region	kWh/m^2/year	210	144	++
Italy (Puglia) Regional	Electricity consumption of the public administration per labour unit	GWh	3,2	3,3	-
Lithuania Investment for growth and jobs	Final energy consumption in service and household sectors	(in 1 000 toe)	2 110	2 090	+

* The tonne of oil equivalent (toe) is a unit of energy defined as the amount of energy released by burning one tonne of crude oil. It is approximately 11 630 kilowatt-hours (kWh).

Source: ECA based on data provided by visited managing authorities.

74 In all five Member States we visited, these 'result' indicators are of a statistical nature, reporting for example on the energy consumption of **all** buildings in a Member State, not just on buildings renovated with EU-funded projects. These indicators, therefore, do not report on energy savings resulting from EU-funded energy efficiency investments.

75 Three out of the five Member States we visited collected data on the amount of energy saved by individual projects, including those concerning residential buildings. However, the Commission did not ask Member States to provide data for monitoring the average cost per unit of energy saved.

76 The Commission and Member States stated in their planning documents that energy efficiency investments also generate other benefits than energy savings (e.g. health improvements, urban rehabilitation, quality of life, reduction of energy poverty, energy bills, air pollution). However, none of the Member States we visited used indicators to measure these additional benefits.

Indicators cannot be used to monitor cost-effectiveness

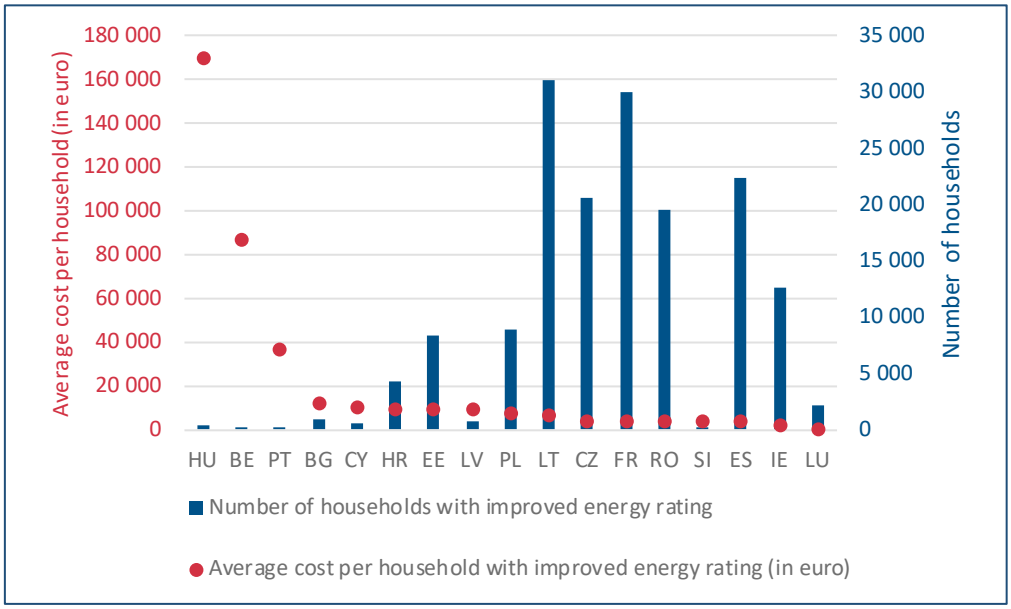
77 None of the indicators used in the five Member States we visited measures the cost-effectiveness of the energy efficiency investments in buildings. Following similar findings in our previous audit we recommended the monitoring of the cost per unit of energy saved and of the payback period planned and achieved[40]. This could help in identifying benchmarks and thresholds for selecting projects (see paragraph ***58***) as well as in assessing the performance of operational programmes in delivering their intended results, when allocating the performance reserve (see paragraph ***82***).

78 However, the Commission did not fully agree to our recommendation, as it considered that the comparability of the recommended indicators would be limited, given the fact that these indicators depend on many factors (e.g. energy prices, climate). The Commission did not design its 2014-2020 monitoring system for monitoring the cost-effectiveness of the investments, i.e. by collecting data on the cost per unit of energy saved. Therefore, despite the claimed increased result-orientation of Cohesion policy spending in 2014-2020, our recommendation has not been implemented yet.

[40] See our special report 21/2012, recommendation 2.

79 On the basis of the figures reported by the Commission, we calculated the average cost per renovated household (see ***Figure 12***) However, the Commission considers that these figures do not report on the real cost of the investments and do not capture the full range of benefits provided.

Figure 12 – Average cost per household with improved energy rating and number of renovated households per Member State



Source: ECA based on data provided by the European Commission (we calculated the average cost per household with improved energy rating by dividing the expenditure for energy efficiency renovation of residential buildings (reported in Annex) by the number of households with improved energy rating reported under Common Output Indicator 31 by 31 December 2018). The graph does not show the average cost per household for the eight Member States (FI, GR, IT, MT, NL, SE, SK, UK) which reported no households with improved energy rating.

The Commission allocated the performance reserve for energy efficiency measures based on spending and outputs, rather than on energy saved

80 To ensure that the necessary actions to promote cost-effective investments in energy efficiency are in place, the Commission required Member States to fulfil a specific *ex ante* conditionality by the start of the 2014-2020 programming period. The actions to put in place for fulfilling this conditionality consisted of measures to ensure:

(a) minimum requirements are in place related to the energy performance of buildings;

(b) a system of certification of the energy performance of buildings;

(c) strategic planning on energy efficiency;

(d) the provision to final customers of individual meters.

81 Except for Italy, all Member States we visited had put in place these actions from the start of the 2014-2020 programming period. Italy put in place the actions (a) and (b) in 2017, i.e. three years after the start of the 2014-2020 programming period.

82 To ensure the result orientation of the operational programmes, the EU set aside a performance reserve (equal to 6 % of the Cohesion policy funding) and allocated it in August 2019 to priorities that had achieved their milestones. Where there are two indicators both must achieve at least 85 % of their milestone value. Where there are three (or more) indicators two must achieve at least 85 % and the other must achieve at least 75 % of its milestone value.

83 As identified in our previous reports[41], such milestones are expressed in terms of spending and output indicators. The five operational programmes we examined expressed the milestones for energy efficiency measures in terms of expenditure and number of households with improved energy rating.

84 Except for Lithuania, the Commission decided whether or not to allocate the performance reserve for energy efficiency measures based on spending and outputs, not on energy saved in residential buildings or on the cost-effectiveness of the investments.

85 In Ireland, the reported indicators "number of households with improved energy consumption classification" and "total amount of eligible expenditure" reported to the Commission are not reliable. Following our audit and Commission observations, the Irish authorities reported that energy ratings did not improve for 52 % of households renovated by the Better Energy Warmer Home Schemes in 2017. The Irish authorities are currently reviewing the projects for households renovated in 2014, 2015, 2016 and 2018 to verify how many did not have their energy rating improved.

86 For Lithuania, in August 2019 the Commission, based on a national system audit report, considered that there was a serious deficiency in the quality and reliability of the whole monitoring system and the data on common and specific indicators. This was not specific to energy efficiency measures. Therefore, the Commission has not yet

[41] Special report 15/2017 (https://www.eca.europa.eu/en/Pages/DocItem.aspx?did=43174), opinion 6/2018 (https://www.eca.europa.eu/en/Pages/DocItem.aspx?did=47745), briefing paper "Delivering performance in Cohesion" (https://www.eca.europa.eu/en/Pages/DocItem.aspx?did=50385).

allocated the performance reserve to any of the measures in the Lithuania's operational programme.

Conclusions and recommendations

87 We examined five operational programmes in Bulgaria, Czechia, Ireland, Italy (Puglia), Lithuania, which allocated some €2.9 billion of their European Regional Development Fund and Cohesion Fund budget in this field. We assessed whether this budget was used cost-effectively and whether the Commission and Member States had applied our recommendations from special report 21/2012 on energy efficiency in public buildings.

88 As in our previous report, we conclude that cost-effectiveness does not guide EU spending on energy efficiency in buildings. Despite improved guidance from the Commission, we found persisting weaknesses, especially in project selection. The funded investments are still not focused on achieving the greatest potential energy savings for the budget invested. Project selection procedures more focused on cost-effectiveness could lead to higher energy savings per euro invested.

89 As these funds are spent under shared management both the Commission and the Member States are responsible for using the funds to achieve the greatest impact. However, the Commission considers that project selection is the exclusive responsibility of Member States. Against a background of increased ambition for the EU energy efficiency targets and a perspective of tightening budgets, ensuring cost-effectiveness of the spending is more important than ever.

90 We found that the needs identified by the Member States in the National Energy Efficiency Action Plans could not be properly considered when designing the 2014-2020 operational programmes due to timing constraints. For the 2021-2027 period, Member States had to submit the National Energy and Climate Plans by 31 December 2019 and the national Long-Term Renovation Strategies by 10 March 2020 to the Commission. These strategic documents should arrive in time to be reflected by Member States in Cohesion policy programmes.

91 As regards the needs assessments of the operational programmes themselves, we found that:

- All five operational programmes we examined identified the need to increase the energy efficiency of their building stocks, in particular residential buildings but did not quantify potential energy savings and the corresponding investment needs (paragraphs ***23*** to ***28***);

- None of the five operational programmes examined described the barriers hampering energy efficiency investments. However Lithuania and Czechia had taken initiatives to address some barriers (paragraphs ***29*** to ***32***);

- Despite energy efficiency investments generating a cost-saving stream for the owner and/or tenant of the building, creating the business case for using repayable financial instruments, four out of the five operational programmes we examined are still using grants as the only means to finance these investments. Only Lithuania put in place a successful EU financial instrument, which provided preferential loans to help renovate some 4 000 multi-apartment buildings (paragraphs ***33*** to ***35***);

- Despite the Commission giving guidance to incentivise deep renovations by providing higher aid rate for deeper renovations, three of the five Member States we visited did not modulate the aid rates and provided 100 % grants regardless of the expected energy savings projects should deliver. Lithuania and Czechia modulated the aid rate to maximise the leverage of private funding (paragraphs ***36*** to ***42***).

Recommendation 1 – Improving the planning and targeting of investments

Before approving programmes that propose to spend Cohesion policy funds on energy efficiency measures the Commission should assess whether these:

(a) are based on analysis of the actions needed to put in place financial instruments or market mechanisms, such as energy performance contracting, and promote the cost-effective use of EU funded grants for deep renovations going beyond minimum energy performance requirements taking into account the specific market conditions;

(b) are aligned with the National Energy and Climate Plans and the national Long-Term Renovation Strategies;

(c) define the estimated energy saving from the use of EU funds;

Timeframe: In time for the approval of the 2021-2027 programmes.

92 As regards the project selection, we found that:

- All five Member States visited required projects to be based on an energy audit and to provide a pre- and post-works energy performance certificate of the buildings (paragraphs ***45*** to ***48***);

- All Member States we visited – except Ireland – required projects of a certain ambition by setting minimum energy ratings buildings should reach after works and/or minimum percentages of energy savings that projects should deliver. However, there were no ceilings on the cost per unit of energy saved, resulting in projects too costly for the energy they expect to save (paragraphs ***49*** to ***58***);

- Except for Italy (Puglia), the Member States we visited allocated the budget to projects on a first-come first-served basis through "open call" procedures, which does not allow consideration of the relative cost and benefits of projects nor prioritisation of projects likely to deliver higher energy savings or other benefits at lower costs (paragraphs ***59*** to ***64***).

Recommendation 2 – Improving project selection procedures

For the 2021-2027 period, the Commission should ensure that managing authorities fulfil the requirements of the Financial Regulation in relation to the principles of economy, efficiency and effectiveness, notably by using project selection procedures that:

— set minimum and/or maximum thresholds for key parameters (e.g. the quantity of energy to be saved, the minimum energy rating the building should reach after project, the net present value, the simple payback time or the cost per unit of energy saved);

— assess the relative costs and benefits of projects and select those delivering higher energy savings and other benefits at lower cost.

Timeframe: In time for the approval of the 2021-2027 programmes.

93 As regards the performance framework, we found that:

- There is no indicator measuring energy saved by investments in residential buildings, thus it is not possible to know the EU budget's contribution to the EU energy efficiency targets. There is also no indicator measuring other benefits these investments should generate (paragraphs ***67*** to ***76***);

- None of the indicators used in the Member States we visited measures the cost-effectiveness of the investments in buildings as the Commission did not design its 2014-2020 monitoring system to provide information on the cost per unit of energy saved (paragraphs ***77*** to ***79***);

- All of the managing authorities we visited (except Italy (Puglia)) carried out the actions defined by the *ex ante* conditionality for energy efficiency investments in good time. However, the criteria for allocating the performance reserve did not ensure the result-orientation of the spending, as the Commission allocated it based on spending and outputs, rather than energy saved or cost-effectiveness (paragraphs ***80*** to ***86***).

Recommendation 3 – Make the performance framework more result-oriented to better monitor the progress toward the EU energy efficiency targets and improve accountability

The Commission should:

(a) provide information both on the aggregate expenditure and amount of energy saved or other results generated by the investments;

(b) define indicators for monitoring the cost-effectiveness of the investments; and

(c) use these indicators when making decisions on the allocating resources in the 2021-2027 period mid-term review.

Timeframe: In time for the approval of the 2021-2027 programmes for (b) and once all the 2021-2027 programmes are approved for (a) and (c).

This Report was adopted by Chamber I, headed by Mr Nikolaos MILIONIS, Member of the Court of Auditors, in Luxembourg on 30 March 2020.

For the Court of Auditors

Klaus-Heiner LEHNE
President

Annex

Annex I 2014-2020 Cohesion policy funds for energy efficiency in buildings

Member States	Budget for residential buildings	Budget for public buildings	Budget for buildings (sum of residential and public buildings)	% of Budget for buildings over total Cohesion policy funds budget in the Member State	% of Budget for buildings spent by 31.12.2018	Expenditure for residential buildings by 31.12.2018
AT	0	5 893 940	5 893 940	1 %	19 %	0
BE	12 000 000	26 330 513	38 330 513	2 %	14 %	2 004 843
BG	116 091 519	80 508 006	196 599 525	3 %	15 %	12 844 101
CY	20 500 000	23 500 000	44 000 000	6 %	20 %	7 058 821
CZ	373 969 708	617 437 463	991 407 171	5 %	21 %	90 193 054
DE	0	892 832 893	892 832 893	5 %	9 %	0
DK	0	0	0	0 %	0 %	0
EE	174 636 461	1 863 044	176 499 505	5 %	46 %	80 542 195
ES	557 157 926	1 028 280 396	1 585 438 322	5 %	7 %	80 505 722
FI	1 996 928	12 011 720	14 008 648	1 %	19 %	571 466
FR	454 230 674	257 357 785	711 588 459	5 %	22 %	126 810 646
GR	248 138 321	307 639 356	555 777 677	3 %	8 %	26 600 287
HR	90 000 000	181 810 805	271 810 805	3 %	23 %	42 350 578
HU	250 323 411	902 749 679	1 153 073 090	5 %	27 %	65 880 774
IE	84 500 000	0	84 500 000	8 %	27 %	22 653 118
IT	41 534 286	1 053 215 228	1 094 749 514	3 %	10 %	1 793 395
LT	336 171 919	160 392 880	496 564 799	7 %	46 %	208 021 084
LU	1 203 638	2 407 277	3 610 915	9 %	39 %	636 990
LV	150 000 000	182 545 246	332 545 246	8 %	6 %	6 587 902
MT	5 088 170	4 866 946	9 955 116	1 %	33 %	2 400 000
NL	9 652 206	20 164 314	29 816 520	3 %	33 %	800 000
PL	750 703 882	1 502 887 179	2 253 591 061	3 %	23 %	68 664 689
PT	143 626 068	442 916 876	586 542 944	3 %	3 %	10 061 529
RO	444 330 119	741 840 094	1 186 170 213	5 %	9 %	81 954 405
SE	13 637 164	12 561 834	26 198 998	2 %	6 %	908 540
SI	6 600 000	142 360 000	148 960 000	5 %	26 %	1 016 859
SK	111 388 554	474 886 480	586 275 034	4 %	34 %	111 338 723
UK	161 251 913	75 302 550	236 554 463	2 %	14 %	6 710 616
EU-28	**4 558 732 867**	**9 154 562 505**	**13 713 295 372**	**4 %**	**18 %**	**1 058 910 337**

Source: ECA based on data provided by the European Commission.

Glossary

Cohesion policy: The EU's main investment policy, which aims to reduce economic and social disparities between regions and Member States. This audit concerned in particular two funds:

(a) Cohesion Fund (CF): An EU fund for reducing economic and social disparities and to promote sustainable development in the EU by funding investments in Member States where the gross national income per inhabitant is less than 90 % of the EU average.

(b) European Regional Development Fund (ERDF): An EU fund aiming to strengthen economic and social cohesion throughout the European Union by correcting imbalances between its regions through financial support, in particular for priority areas such as innovation and research, the digital agenda, small and medium-sized enterprises and the low carbon economy, environment and sustainable transport.

Cost-effective investment: Lowest cost alternative for achieving a given level of performance or the highest level of performance alternative for a given level of cost. It may also be used for the comparison and prioritisation of alternative projects within a programme. (Kreith, F., Goswami, Y. D. *Handbook of Energy Efficiency and Renewable Energy,* Taylor & Francis, Boca Raton, USA, 2007). The principle of efficiency which concerns the best relationship between resources employed, activities undertaken and objectives achieved is a requirement for EU budget spending (see Article 33(1)(b) of the Financial Regulation).

Cost-optimal methodology for buildings: The cost-optimal methodology aims to create a legal framework for raising the Member States' minimum energy performance requirements for buildings to ensure that all economically rational measures are adopted.

Energy audit: A standard energy audit consists of a comprehensive energy analysis for the energy systems of a facility. In particular, it includes the development of a baseline for its energy use, an evaluation of potential energy savings, and the cost-effectiveness of appropriately selected energy conservation measures.

Energy efficiency: It refers to using less energy input for an equivalent level of economic activity or service. Investment in energy efficiency provides a better economic and societal return than investment in energy supply. Energy efficiency increases the potential for economic growth, makes companies more competitive, lowers household energy bills and leads to lower energy import dependency, reduced emissions and improved air quality.

Energy Efficiency Obligation Schemes: Market-based instruments, defined by Article 7 of the Energy Efficiency Directive 2012/27/EU, that place requirements for 'obligated parties' to meet quantitative energy savings targets across their portfolio. Obligated parties may be retail energy sales companies, energy or transport fuel distributors.

Energy performance contracting: Contractual arrangement between the beneficiary and the provider of an energy efficiency improvement measure, verified and monitored during the whole term of the contract, where investments (work, supply or service) in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement or other agreed energy performance criterion, such as financial savings (Article 2(27) of the Energy Efficiency Directive 2012/27/EU).

***Ex ante* conditionalities:** Conditions, based on pre-defined criteria for fulfilment established in the Common Provisions Regulation 1303/2013, which are regarded as necessary prerequisites for the effective and efficient use of the EU Cohesion policy funds. When preparing operational programmes under the 2014-2020 programme period, Member States have to assess whether these conditions are fulfilled. If they have not been fulfilled, action plans needed to be prepared to ensure fulfilment of the conditions by 31 December 2016.

Managing authority: The national, regional or local body designated by the Member Stateto manage an operational programme. Its tasks include selecting projects for funding, monitoring their implementation and reporting to the Commission on results achieved.

National Energy Efficiency Action Plan (NEEAP): Are strategic tools at Member States level for their planning, coordination and implementation of energy efficiency measures in all sectors. They set responsibilities; they might estimate needs and allocate budgets. The NEEAPs are an obligation to be fulfilled by the Member States, but they have no direct link to Cohesion Funding. There is no legal requirement or obligation to report on the energy savings achieved through EU Funds, nor an obligation to use EU funds to fund the areas identified in the NEEAPs.

Operational programme (OP): Sets out a Member State's or a region's priorities and specific objectives and how the funding (EU and national public and private co-financing) from the Cohesion policy funds will be used during a given period (currently 2014-2020) to finance projects. These projects must contribute to achieve a certain number of objectives specified at the level of the OP's priority axis. An OP is prepared by the Member State and has to be approved by the Commission before any payments from the EU budget can be made. OPs can only be modified during the period covered if both parties agree.

Partnership agreements (PAs): Are entered into between the European Commission and each Member State for the 2014-2020 programme period. They set out the national authorities' plans on how to use funding from the European Structural and Investment Funds (ESIF) and outline each country's strategic goals and priorities for investment, linking them to the overall aims of the Europe 2020 strategy for smart, sustainable, and inclusive growth. They are prepared by the Member State in a dialogue with the Commission and must be adopted by the Commission.

Performance reserve: Accounts for 6 % of resources allocated to the ERDF and CF under the Investment for Growth and Jobs goal. These funds are included in the programmes, but are definitively allocated or reallocated, subject to the outcome of the performance review in 2019.

REPLIES OF THE COMMISSION TO THE SPECIAL REPORT OF THE EUROPEAN COURT OF AUDITORS

"ENERGY EFFICIENCY IN BUILDINGS: GREATER FOCUS ON COST-EFFECTIVENESS STILL NEEDED"

EXECUTIVE SUMMARY

I. This report on energy efficiency in buildings in the 2014-2020 programming period is timely in the light of the beginning of the preparation of the 2021-2027 cohesion policy programmes. In the meantime, the Commission has presented the European Green Deal in December 2019, which prioritises energy efficiency.

Energy production and consumption represent 75% of the EU's greenhouse gas emissions. Therefore, improving efficiency in energy use and moderating energy demand are key to achieving the overall Energy Union goals for clean, secure, competitively priced energy and, above all, to achieving the ambition to decarbonise the EU economy by 2050 as presented in the European Green Deal. The application of the 'energy efficiency first' principle across the board will be key.

With 40% of energy consumption and 36% of CO_2 emissions in buildings, the EU's climate neutrality and energy efficiency objectives can only be reached by significantly scaling up the current low building renovation rates and boosting the energy performance of the existing building stock. To tackle this, the European Green Deal launches a building 'renovation wave'.

II. Cost-effectiveness assessments have to consider not only the energy savings in buildings as such, but also the contribution to multiple policy objectives of the implemented interventions, and their benefits beyond energy savings, such as economic, social and environmental impacts. Accordingly, cohesion policy funding contributes both to long-term energy efficiency targets and to long-term solutions to energy poverty, including deep building renovations. Beyond cost-effectiveness considerations, cohesion policy investments in energy efficiency therefore also have an important social objective tackling energy poverty.

III. As the ECA notes, for the 2014-2020 period, the European Regional Development Fund (ERDF) and the Cohesion Fund (CF), together with national public and private co-financing, provide some €19 billion in total for investments in energy efficiency in public and residential buildings. In addition, a number of other EU instruments work in complement to support energy efficiency investments, in particular the European Fund for Strategic Investments (EFSI) and Horizon 2020.

VI. The Commission agrees on the importance of basing cohesion policy investments in energy efficiency in buildings on energy audits or Energy Performance Certificates. It considers that the quality of projects selected depends not only on the type of selection procedure, but also on the selection criteria applied. In many types of assistance, it is more efficient to set a quality threshold and accept all projects that meet them than to apply a method of direct comparison of applications.

VII. The Commission clarifies that the monitoring system for cohesion policy funding allows aggregating data for common indicators. The current framework does not include a common indicator measuring the amount of energy saved in residential buildings. The energy saving is measured in some programmes by programme specific indicators, which cannot be aggregated. Other common and programme specific indicators may measure other benefits.

The Commission has proposed for cohesion policy 2021-2027 a common result indicator "*Annual final energy consumption (of which: residential, private non-residential, public non-residential)*". Nevertheless, the Commission underlines that the energy savings produced by ERDF/CF investments

do not account for any interrelations, or systemic changes, or for external factors (such as weather) that might overcompensate the savings effect of the measure. Those factors have an impact on the absolute level of primary and final energy consumption that are the terms in which the EU energy efficiency target is expressed. Therefore, from a methodological point of view, the savings from individual measures cannot be aggregated and compared to the EU energy efficiency target.

VIII. The Commission considers the need to ensure that the EU budgetary resources are used in an economical way. EU added value and performance are key requisites when it comes to project selection. It stresses that this should be considered in the wider context of the cohesion policy objectives for economic, social and territorial cohesion, as well as broader EU policy objectives, and that support should be targeted to projects that cannot be implemented on markets terms.

According to the Commission's proposal for cohesion policy funds 2021-2027, in selecting operations, the managing authority shall ensure that selected operations present the best relationship between the amount of support, the activities undertaken and the achievement of objectives, thus including the value for money principle. Also, selection criteria and procedures shall ensure the prioritisation of operations to be selected with a view to maximise the contribution of EU funding to the achievement of the objectives of the programme.

IX. The Commission accepts the recommendation on planning and targeting of investments and partially accepts the recommendations on the project selection procedures and the performance monitoring system.

The Commission refers to its replies to the recommendations.

INTRODUCTION

04. The Commission will promote the application of the 'energy efficiency first' principle wherever relevant and will provide guidance to that effect. Improving efficiency in energy use and moderating energy demand in particular in buildings are key to achieving the overall Energy Union goals for a clean, secure, competitively priced energy and, above all, to the long term decarbonisation of the economy.

The principle of 'energy efficiency first' was introduced in the Regulation on the Governance of the Energy Union and Climate Action[1]. It means taking utmost account in energy planning, and in policy and investment decisions, of alternative cost-efficient energy efficiency measures to make energy demand and energy supply more efficient, in particular by means of cost-effective end-use energy savings, demand response initiatives and more efficient conversion, transmission and distribution of energy, whilst still achieving the objectives of those decisions.

12. National Energy Efficiency Action Plans (NEEAPs), together with the long-term strategies for the renovation of the building stock, are key strategic documents on energy efficiency measures at national level. The NEEAPs provide a framework for the development of the national energy efficiency strategies and cover energy efficiency improvement measures in view of achieving the national energy efficiency targets.

13. The National Energy and Climate Plans (NECPs) will replace the NEEAPs in view of the achievement of the EU energy efficiency target for 2030. The NECPs are required under the Governance Regulation and cover the five dimensions of the Energy Union.

[1] Regulation (EU) 2018/1999, Article 2(18)

OBSERVATIONS

22. The Commission refers to its replies in paragraphs 24 and 25.

24. The development of the first NEEAPs 2014 under the 2012 Energy Efficiency Directive was concurrent to the preparations of the operational programmes subject to this audit. As a result, NEEAPs were not always available during the elaboration phase of the operational programmes.

25. As laid down in the Energy Efficiency Directive, the NEEAPs include a set of policy measures in order to achieve the national indicative energy efficiency target that each Member State set. The NEEAPs serve as broad strategic policy documents.

The analysis done in the NEEAPs could be used by Member States for the cohesion policy programme preparation, to identify barriers to investments and to set a coherent approach to improve energy efficiency at national level. However, they are not designed to identify specific action areas or delivery mechanisms for the use of cohesion policy funds.

27. The Commission considers that the new operational programme Puglia 2014-2020 sets out the reasoning for support to public buildings including social housing. It assesses alternative interventions in other sectors (public lighting), and selects the chosen measure as the best response to the identified challenges.

Regarding the Czech investment strategy, it was based on the National Energy Efficiency Action Plan. As indicated in individual programmes, the highest potential for savings was identified in the residential sector (30.5%), with manufacturing and industry second (24.5%). The partnership agreement identified entrepreneurs, residential sector and public sector as the main targets for the investment as regards energy efficiency.

28. The Commission highlights that the Partnership Agreement should contain an analysis of disparities, development needs and growth potential with reference to the thematic objectives and the territorial challenges, taking account of the National Reform Programme and relevant Country-Specific Recommendations. Operational programmes need to be consistent with the content of the Partnership Agreement. Detailed analysis by specific investment area is not required to be included in the programme itself.

Common reply to paragraphs 29 and 30.

The Commission is aware of the significant barriers impeding a widespread roll-out of renovation measures and it has been and is working to address them. The energy renovation of buildings is a complex and difficult process, and addressing the multiple barriers, market and regulatory failures is, keeping in mind the principles of subsidiarity and complementarity, one of the main objectives of the EU policy and EU financial support in the area of energy efficiency measures in buildings.

The Smart Financing for Smart Buildings initiative[2] is a key example of this, with the main bottlenecks linked to the need to use better public funding, to aggregate projects and to de-risk investments identified and solutions to address them suggested. Further to this, various measures have been put in place (the De-risking Energy Efficiency Platform (DEEP) database, the Underwriting

[2] Adopted as part of the Clean Energy for All Europeans Package in November 2016, COM(2016) 860 final, 30.11.2016

Toolkit, advisory hubs, Sustainable Energy Investment (SEI) Forums, etc.) to concretely address those bottlenecks.

32. The Commission considers that the key barriers to energy efficiency investments are horizontal and not limited to investment co-financed by cohesion policy funds. The report prepared by the Energy Efficiency Financial Institutions Group (EEFIG) in 2015 gives clear messages in this respect. They are taken into consideration in relevant strategic energy policy documents and are not meant to be detailed as such in cohesion policy programmes.

33. The Commission agrees with the ECA and it will continue to support Member States to use financial instruments, also in line with market mechanisms, such as energy performance contracting, in this area, in order to leverage the private investment needed to achieve the EU climate objectives.

Nevertheless, while the renovations certainly generate financial savings for the beneficiaries as well as wider benefits for the society, this should also be considered in the context of the current immature state of the renovation market and the many market barriers that are still hindering the renovation of buildings.

The Commission considers that the deployment of financial instruments should be based on the specific market conditions for different Member States and for different types of projects and target groups. Combination with a grant component is often needed, in particular to incentivise deeper renovations, to help upscale innovative technologies or to address social issues, e.g. energy poverty.

35. The Commission agrees on the importance of financial instruments in this area and will continue to promote their use in the next programming period.

The Commission points out that the Czech authorities tried to implement energy efficiency in the residential sector through financial instruments, however they did not receive any offers from potential financial intermediaries during the call launched in 2018.

The Commission also refers to its reply to paragraph 33.

40. The Commission reiterates that selection of projects is the responsibility of the managing authorities that define the selection procedures and criteria and apply them when examining the applications for funding.

Box 3 - Examples of operational programmes targeting "low-hanging fruit" energy efficiency upgrades

First paragraph - The Commission understands that the "Better Energy Warmer Homes" scheme delivers a range of energy efficiency measures to households that are vulnerable to energy poverty. The objectives of the scheme are to improve the energy efficiency of the household at risk and in the process reduce the amount of expenditure that is required to be spent on energy. Other secondary objectives are to improve health and well-being, while reducing the amount of disposable income spent on energy.

The Commission also refers to its reply to paragraph 42.

Second paragraph - The Commission refers to its reply to paragraph 40.

42. The Commission agrees that simple upgrades may result in a "lock-in effect" and also that simple upgrades with quick payback times are usually financially viable and should therefore generally be financed using financial instruments, or without any public support.
However, while the ERDF and CF are expected to primarily focus on long-term solutions, including deep building renovations, as also pointed out in the "Feasibility study to finance low-cost energy efficiency measures in low-income households from EU funds"[3], there may be scope for complementary support for delivery of low-cost energy efficiency measures to low-income households in cases where there is a social need.

43. The Commission considers that cost-effectiveness, while being a major determinant of public spending decisions, needs to be assessed against the objectives of cohesion policy, in line with the EU Financial Regulation. Energy efficiency falls under one of the multiple objectives of cohesion policy programmes. Cohesion policy is an integrated policy, aiming at economic, social and territorial cohesion, and a specific operation can contribute to multiple objectives or have several co-benefits, also in terms of broader EU policy objectives, which do not lend themselves easily to a purely economic analysis. This is often the case of interventions to improve energy efficiency in buildings, which may be combined for example with reducing energy poverty.

In these cases, a certain investment may be less cost-effective but more affordable for the beneficiary. By contrast, investments with high energy savings per euro invested that are financially viable could be financed by the private market, without public support.

44. Common Commission reply to point a, b and c:

The technical guidance "Financing the energy renovation of buildings with Cohesion Policy funding" quoted by the ECA, published in 2014, aims to help cohesion policy managing authorities plan and deploy sustainable energy investments in buildings within operational programmes. It especially provides a list of good practice approaches and case studies. Being a guidance document, it does not set out regulatory requirements.

The technical guidance proposes a roadmap to implement a programme for financing the energy renovation of buildings using cohesion policy funding. This includes the definition of selection criteria. In this respect, the guidance suggests a number of requirements, for instance to carry out energy audits in more complex renovation projects. It clarifies also that requirements should be adapted to the project size, and that the net present value (NPV) is generally recommended for assessing cost-effectiveness, rather than the simple payback time.

The Commission also refers to its reply to paragraph 64.

48. In its reply to the ECA's special report 21/2012 the Commission clearly underlined that it could not fully agree to the set-up of the recommended indicators at programme level as "*the comparability of the recommended indicators would be limited, given the fact that these indicators depend on many factors (e.g. energy/commodity prices, climate conditions) that could render them misleading".*

Indeed, beyond the additional red tape and burden this would create for involved beneficiaries and authorities, the Commission considers that investments in energy efficiency are project-specific and related to several factors (state of the building, climatic conditions, labour costs, energy costs,

[3] Feasibility study to finance low-cost energy efficiency measures in low-income households from EU funds", Final Report for DG Energy, August 2016, https://ec.europa.eu/energy/sites/ener/files/documents/low_cost_energy_efficiency_measures_-_final_report.pdf.

material costs, type of use, etc.) which cannot be standardised. Hence, any estimates of cost per unit of energy saved at programme level would be of very limited use.

51. The Commission refers to its reply to paragraph 43.

The rationale of intervention with cohesion policy support is also to address market failures and invest in projects, which would otherwise not have been supported. In particular, cohesion policy investments in energy efficiency also target social goals, such as tackling energy poverty, or long-term climate and energy targets investing in more costly deep renovation with typically longer payback times.

The technical guidance referred to in paragraph 44 recommends using the Net Present Value (NPV), as it enables to account the project's cash flow over its lifetime. NPV is suitable for projects with an important investment volume. Alternative methods (e.g. energy saved in relation to funding or payback period) can also be used for simpler projects; however, under these methods it is important to specify the period over which the savings are calculated, in particular for deep renovations. Otherwise, there is a risk of prioritising only shallow measures.

The Commission also refers to its reply to paragraph 48.

53. The Commission considers that simple upgrades with quick payback times are usually financially viable and should therefore generally be financed using financial instruments, or without any public support.

The ERDF and CF are expected to primarily focus on contributing to the long-term energy efficiency targets and to long-term solutions to energy poverty, including deep building renovations.

The Commission also refers to its reply to paragraph 51.

The Commission considers that there are differences between the De-risking Energy Efficiency Platform (DEEP) projects and the ERDF and CF interventions, which lead to the difference in payback periods. DEEP shows very large differences per measure type – measures such as changing the lighting or the heating boiler have shorter paybacks, while measures such as those often targeted by the ERDF and CF, like building insulation and integrated renovation, have, respectively, payback periods of 11 and 14 years. In addition, it is necessary to consider the differences between Member States, regions and individual buildings. As an illustration, the average payback time of DEEP for Lithuania, addressing integrated renovation, is 20.9 years.

54. The Commission refers to its replies to paragraph 48 and 51.

56. The scheme is targeted at low-income households at risk of energy poverty, aiming also to reduce the amount spent on energy by households.

57. In its reply to the ECA's special report 21/2012 the Commission clearly underlined that it could not fully agree to the recommendation.

The Commission considers that investments in energy efficiency are project-specific and related to several factors (state of the building, climatic conditions, labour costs, energy costs, material costs, type of use, etc.) which cannot be standardised. Hence, a standard investment cost per unit or a definition of a standard payback time cannot be set up by the Commission at EU level.

As indicated in the reply to paragraph 53, integrated or deep renovations are usually cost-intensive and this has significant impact on the unit cost and payback time. The introduction of a maximum acceptable simple payback time could be a disincentive to deep renovations.

58. The guidance further suggests that the net present value (NPV) is generally recommended for assessing cost-effectiveness, rather than the simple payback time.

60. In principle, Lithuania provides for a competitive selection procedure (and several additional priority selection criteria, including efficiency, environmental issues, higher energy class) to be used if, in a given call, investment amounts required in eligible applications exceed the funding amount available for that call (since 2018). In the case of the financial instrument, with a substantial loan component, it took time and effort to build a sufficient project pipeline, thus competitive selection procedures was not an issue at beginning of the financial period.

61. The Commission refers to its reply to paragraph 40.

The Commission considers that the quality of projects selected depends not only on the type of selection procedure, but also on the selection criteria applied. In many types of assistance, it is more efficient to set a quality threshold and accept all projects that meet them than to apply a method of direct comparison of applications.

Further, in an EU context of 'better regulation' and simplification, the right balance has to be struck between cost-effectiveness of the investments and cost-effectiveness of the whole procedure and management of the funding, especially if it affects the recipients of the funds.

The Commission refers also to its replies to the ECA's Special Report No 21/2018 *"Selection and monitoring for ERDF and ESF projects in the 2014–2020 period are still mainly outputs-oriented".*

62**.** See Commission reply to paragraph 60.

63. In its reply to the ECA's special report 21/2012, the Commission clearly underlined that it could not fully agree to the recommendation. The Commission also refers to its replies to paragraph 43 and 57.

64. The guidance clarifies that selection criteria can be based on four main categories, of which cost-effectiveness is one, and stresses that other co-benefits should also be taken into account when selecting projects. As regards cost-effectiveness, it explains that this can be determined in multiple ways and sets out advantages and limitations of different approaches, concluding that the net present value (NPV) is generally recommended for assessing cost-effectiveness.

65. The Commission clarifies the EU Financial Regulation requires to set objectives for all sectors of activity covered by the budget, and to monitor the achievement of those objectives by performance indicators. According to this provision, the regulatory framework for cohesion policy requires the programmes to set output and result indicators. Output indicators measure what is delivered by the programmes, whereas result indicators measure the change to the overall society. Cost-effectiveness does not fall under the concept of output and result indicators.

66. a) The Commission further clarifies that result orientation of the European Structural and Investment Funds, including the ERDF and CF, is based on three pillars:

- a clear articulation of the specific objectives of programmes with a strong intervention logic (the result orientation of programmes) and result indicators with definitions and measurable targets;

- the introduction of ex ante conditionalities to ensure that the necessary prerequisites are in place for the effective and efficient use of EU support;
- the establishment of clear and measurable milestones and targets to ensure progress is made as planned (performance framework).

The performance framework of the operational programmes does not include objectives, but only indicators (with milestones and targets). Furthermore, the performance framework only includes a subset of the complete indicator set of the operational programmes[4], and as such it does not necessarily include indicators concerning energy efficiency.

The regulatory framework underlines that the milestones and targets for performance framework indicators should be "realistic, achievable, relevant, capturing essential information on the progress of a priority" as well as "verifiable, without imposing a disproportionate administrative burden".

b) The Commission stresses that there is no requirement that indicators should report primarily on the amount of energy saved. The indicators should express the outputs generated by the operations that are relevant. The current monitoring system in place allows aggregating data for common indicators. The regulation allows using programme specific indicators, which are not possible to aggregate due to their nature.

67. The operational programme Puglia 2014-2020 sets among its output indicators the common indicator CO32 'Energy efficiency: Decrease of annual primary energy consumption of public buildings' for the investment priority 4(c) related to energy efficiency in public buildings and the housing sector. The 2023 target is a decrease of 12 million kWh/year.

71. While the regulatory framework does not include a common indicator measuring the amount of energy saved in residential buildings, energy saving is measured in some programmes by programme specific indicators. However, due to the programme specific nature of these indicators their values cannot be aggregated at EU level (different definitions and measurement units across Member States).

The €4.6 billion allocation is not limited to efficiency investments in residential buildings, but also includes demonstration projects and supporting measures.

The Commission also underlines that the energy savings produced by ERDF/CF investments do not account for any interrelations, or systemic changes, or for external factors (such as weather) that might overcompensate the savings effect of the measure. Therefore, from a methodological point of view, the savings from individual measures cannot be aggregated and compared to the EU or national energy efficiency targets.

75. The Commission refers to its replies to paragraph 65 and 67.

76. According to the regulatory framework, the result indicators should correspond to the specific objective of the priority axis, which measure what is intended to be changed with the interventions of the operational programme. The ancillary benefits are not required to be expressed by result indicators.

77. The Commission refers to its replies to paragraph 65 and 67.

[4] Commission Implementing Regulation (EU) No 215/2014, Article 5(1)

The allocation of the performance reserve is regulated by Article 22(3) of the Common Provisions Regulation, and it is only based on the achievement of milestones of the indicators selected for the performance framework.

78. The Commission refers to its replies to paragraph 48 and 57.

The Commission recalls that the monitoring system designed for cohesion policy is set out in the regulatory framework. The Commission considers that it captures information relevant for the objectives of its interventions, which are the cohesion policy objectives set in the Treaty and the thematic objectives defined for the cohesion policy funds in the regulatory framework. According to the EU Financial Regulation, sound financial management means implementation of the budget in accordance with the principles of economy, efficiency and effectiveness. Cost-effectiveness is relevant in this context, however it is not an objective on its own which would need to be captured by the monitoring system.

79. The Commission considers that to get a better picture about the average cost per household, one would need to look into individual programmes and also use evaluations; in fact, any calculations related to cost of energy saved would need to be carried out at the level of a specific project.

The Commission also refers to its reply to paragraph 71.

83. The Commission considers that result indicators may not be appropriate for the performance framework because of the timing of when results can be achieved (beyond the programming period) and – depending on the nature of the indicator – the need for evaluation to disentangle the effects of the policy from those of factors external to the programme.

84. The Commission refers to its reply to paragraph 77.

85. The Commission has repeatedly raised with Ireland the issue of the reliability of the data reported for the output indicator *"Number of households with improved energy consumption classification"*, both in a number of meetings with the relevant authorities and in written observations to the 2017 and 2018 Annual Implementation Reports. The Irish authorities are reviewing the projects in order to report a reliable value for the indicator in question. No issues were raised regarding the reliability of the total amount of eligible expenditure reported to the Commission in the review of the performance framework.

CONCLUSIONS AND RECOMMENDATIONS

88. The Commission considers it important to ensure that the EU budgetary resources are used in an economical way: EU added value and performance are key requisites when it comes to project selection.

The Commission reiterates that while cost-effectiveness of the spending is certainly a key element, it must be considered in the wider context of the cohesion policy objectives for economic, social and territorial cohesion, as well as broader EU policy objectives.

In line with the regulatory framework for cohesion policy, the focus is on the achievement of objectives. The Commission considers that EU support should be targeted to projects that contribute significantly to the identified policy objectives.

Also, support should be targeted to projects that really need support, and cannot be implemented on markets terms. Moreover, the Commission considers that simple upgrades with high energy savings

per euro invested are usually financially viable and should therefore generally be financed by the private market, without any public support.

Therefore, the Commission considers that cost-effectiveness assessments have to consider not only the energy savings potential of buildings in the medium and long term, but also the contribution to multiple policy objectives of the implemented interventions, and their various benefits beyond energy savings. Thus, co- benefits such as economic, social and environmental impacts should also be taken into account when selecting projects.

89. Indeed, the Commission stresses that in line with the regulatory framework, the selection of projects is the responsibility of the designated managing authorities in the Member States, which define the selection criteria and apply them when examining the applications for funding.

The Commission also refers to its reply to paragraph 88.

91. First indent - The Commission highlights that the 2014-2020 Partnership Agreement should contain an analysis of disparities, development needs and growth potential with reference to the thematic objectives and the territorial challenges, taking account of the National Reform Programme and relevant Country-Specific Recommendations. Operational programmes need to be consistent with the content of the Partnership Agreement. Detailed analysis by specific investment area is not required to be included in the programme itself.

Second indent - The Commission considers that the key barriers to energy efficiency investments are horizontal and not limited to investment co-financed by cohesion policy funds. They are taken into consideration in relevant strategic energy policy documents and are not meant to be detailed as such in cohesion policy programmes.

Third indent - The Commission agrees with the ECA and it will continue to support Member States to use financial instruments, also in line with market mechanisms, such as energy performance contracting, in this area, in order to leverage the private investment needed to achieve the EU climate objectives.

While the renovations certainly generate financial savings for the beneficiaries, this should also be considered in the context of the current immature state of the renovation market and the many market barriers that are still hindering the renovation of buildings.

The Commission considers that the deployment of financial instruments should be based on the specific market conditions for different Member States and for different types of projects and target groups, in line with the results of the ex-ante assessment required by the regulatory framework. Combination with a grant component is often needed, in particular to incentivise deeper renovations, to help upscale innovative technologies or to address social issues.

The Commission also points out that the Czech authorities tried to implement energy efficiency in the residential sector through financial instruments, however they did not receive any offers from potential financial intermediaries during the call launched in 2018.

Fourth indent - The Commission reiterates that selection of projects is the responsibility of the managing authorities that define the selection procedures and criteria and apply them when examining the applications for funding.

Recommendation 1 – Improving the planning and targeting of investments

The Commission accepts this recommendation.

The Commission further considers that there is scope for the use of grants in a range of situations where financial instruments are not sufficient. This reflects actual market conditions, such us the immature state of the renovation market, the barriers faced by the sector, the need to support upscaling of innovative technologies, or to address social issues, e.g. energy poverty.

92. Second indent - The Commission reiterates that it considers that investments in energy efficiency are project-specific and related to several factors (state of the building, climatic conditions, labour costs, energy costs, material costs, type of use, etc.) which cannot be standardised.

Third indent - The Commission reiterates that selection of projects is the responsibility of the managing authorities that define the selection criteria and apply them when examining the applications for funding.

The Commission considers that the quality of projects selected depends not only on the type of selection procedure, but also on the selection criteria applied. In many types of assistance, it is more efficient to set a quality threshold and accept all projects that meet them than to apply a method of direct comparison of applications.

Further, in an EU context of 'better regulation' and simplification, the right balance has to be struck between cost-effectiveness of the investments and cost-effectiveness of the whole procedure and management of the funding, especially if it affects the recipients of the funds.

The Commission refers also to its replies to the ECA's Special Report No 21 2018 "Selection and monitoring for ERDF and ESF projects in the 2014–2020 period are still mainly outputs-oriented".

Recommendation 2 – Improving project selection procedures

The Commission partially accepts this recommendation.

The Commission recognises the need to ensure that EU budgetary resources are used in accordance with the principles of sound financial management.

However, under shared management, project selection pertains to the mandate and responsibilities of Member States' managing authorities. The Commission participates in an advisory capacity in monitoring committees, where the methodology and criteria used for the selection of projects are approved.

For energy efficiency investments in buildings, specifically, managing authorities need to establish selection criteria and procedures tailored to the objectives of each measure, taking into account that such investments in buildings are project-specific, non-standardised and depend on several factors (state of the building, climatic conditions, labour costs, energy costs, material costs, type of use, etc.). Notwithstanding, the Commission will encourage managing authorities to use selection criteria and procedures for energy efficiency investments in buildings that include some key parameters for linking their energy efficiency investments in buildings to the targeted or achieved energy savings. However, the Commission cannot impose on managing authorities to use a specific methodology for selecting projects.

Moreover, the Commission considers that the specific requirements and procedures set out under indent 1 and 2 of this recommendation are not always appropriate against the policy objectives sought when it comes to the use of EU funding for energy efficiency investments in buildings. In some cases,

the proposed parameters could be a disincentive to deep renovations. This could be the case, for example, with the introduction of a maximum acceptable payback time.

The Commission notes that according to its proposal for cohesion policy funds 2021-2027, in selecting operations the managing authority shall ensure that selected operations present the best relationship between the amount of support, the activities undertaken and the achievement of objectives. Selection criteria and procedures should also give priority to operations, which maximise the contribution of EU funding to the achievement of the objectives of the programme[5]. These provisions aim at preventing the selection of projects with low contribution to the objectives of the programme.The Commission also notes that the provisions of the Energy Performance of Buildings Directive need to be respected, including the new requirement for Member States to link their financial measures for energy efficiency improvements in the renovation of buildings to the targeted or achieved energy savings.

93. First indent - The regulatory framework establishes a list of common output indicators per Fund, which have to be used whenever appropriate, i.e. where the indicator is relevant to express the output/result of the supported investment.

The common indicators were designed to aggregate information across Member States for the frequently supported actions, but due to the diversity of the investments under cohesion policy these indicators cannot express all the outputs.

In addition, programme-specific indicators are used which can better reflect the specific investments. Due to their specific nature, they cannot be aggregated at EU level.

The Commission also refers to its reply to paragraph 71.

Second indent - The regulatory framework requires programmes to set output and result indicators for each priority axis. Output indicators measure what is delivered by the programmes, whereas result indicators measure the change to the overall society. Cost-effectiveness does not fall under the concept of output and result indicators.

Third indent - The allocation of the performance reserve is regulated by Article 22(3) of the Common Provisions Regulation, and it is only based on the achievement of milestones of the indicators selected for the performance framework.

Recommendation 3 – Make the performance framework more result-oriented to better monitor the progress toward the EU energy efficiency targets and improve accountability

The Commission partially accepts this recommendation.

The Commission can provide the information requested under part (a) of the recommendation once all the 2021-2027 programmes are approved.

The Commission considers that the cost-effectiveness should be analysed on the basis of monitoring data relating to input and outcomes. At the level of the programmes, the outcomes are measured both by common and programme-specific indicators; therefore the programme-specific outcomes cannot be aggregated at EU level. Moreover, they do not necessarily capture all the outcomes. Therefore, the Commission considers that a cost-effectiveness analysis is only possible at the level of individual

[5] COM(2018) 375 final, 29.5.2018, see in particular Article 67

projects. The comparability of such analysis among Member States would be limited, due to the diverse scope of the investments specific to the particular region or Member State.

As a consequence, the Commission will not be in a position to use such indicators for the purpose of decisions in the context of the 2021-2027 mid-term review for each programme. Any re-programming will be done at the initiative of the Member State, based on the outcome of the review and it will take into account *inter alia* the new challenges identified in the relevant Country-Specific Recommendations; the progress in implementing the National Energy and Climate Plan, if relevant; the socio-economic situation; the main results of relevant evaluation and the progress in achieving the milestones.

Audit team

The ECA's special reports set out the results of its audits of EU policies and programmes, or of management-related topics from specific budgetary areas. The ECA selects and designs these audit tasks to be of maximum impact by considering the risks to performance or compliance, the level of income or spending involved, forthcoming developments and political and public interest.

This performance audit was carried out by Audit Chamber I Sustainable use of natural resources, headed by ECA Member Nikolaos Milionis. The audit was led by ECA Member João Figueiredo, supported by Michael Bain, Principal Manager; Lorenzo Pirelli, Head of Task; Aris Konstantinidis, Radostina Simeonova, and Jolanta Žemailaitė, Auditors. Miroslava Chakalova-Siddy and Richard Moore provided linguistic support.

From left to right: Lorenzo Pirelli, João Figueiredo, Paula Betencourt, Aris Konstantinidis, Terje Teppan-Niesen and Michael Bain.

Timeline

Event	Date
Adoption of Audit Planning Memorandum (APM) / Start of audit	23.1.2019
Official sending of draft report to Commission (or other auditee)	16.12.2019
Adoption of the final report after the adversarial procedure	30.3.2020
Commission's (or other auditee's) official replies received in all languages	20.4.2020

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We assessed whether EU co-funded energy efficiency investments in buildings had cost-effectively helped the EU toward its 2020 energy saving target. We concluded that the operational programmes and the project selection were not driven by a cost-effectiveness rationale. While Member States required buildings to be renovated to save a minimum of energy and improve their energy rating, this sometimes happened at a high cost. Because of a lack of comparative assessment of project merits and of minimum/maximum thresholds for cost-effectiveness, projects delivering higher energy savings or other benefits at lower cost were not prioritised. We recommend improving the planning, selection and monitoring of the investments to improve the cost-effectiveness of the spending.

ECA special report pursuant to Article 287(4), second subparagraph, TFEU.

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