iBRoad2EPC

Integrating Building Renovation Passports
into Energy Performance Certification schemes
for a decarbonised building stock

Enhancing incentives through iBRoad2EPC

How to best use financial and non-financial incentives for renovation in implementing markets

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EXECUTIVE SUMMARY

The iBRoad2EPC project funded under Horizon 2020, seeks to bridge the Building Renovation Passport (BRP) with Energy Performance Certificates (EPCs). Building on the success of the iBRoad project in developing BRPs for single-family homes, iBRoad2EPC broadens the focus to include multi-family and public buildings and aims to extend and enhance the EPC format with BRP elements and new indicators, while improving its reliability and effectiveness in facilitating deep renovation. This report examines how an integrated EPC-BRP approach, as developed within the iBRoad2EPC project, can be used in incentive schemes for renovation in the six iBRoad2EPC pilot countries - Bulgaria, Greece, Spain, Poland, Portugal and Romania. The report starts by individually assessing the role of EPCs in various current financial and non-financial incentive programmes for building renovation and their alignment with the Long Term Renovation Strategies (LTRSs). It then identifies the opportunities and recommendations for integrating the iBRoad2EPC concept into incentive programmes.

Based on the insights of experts from each partner country and desktop research, various incentive programmes were identified for each country, most of which are subsidies for implementing energy performance improvements. The assessment of the role for EPCs in these incentive programmes showed that EPCs are mostly required before and after the renovation and are used to evaluate the improvement in building's energy performance. EPCs are also sometimes used to identify and prioritise the worst performing buildings for incentive programmes, for example, in Greece. Furthermore, EPCs are used as a tool to evaluate the incentive programme itself, as in the case of Portugal.

Given the urgency yet high costs of deep renovation, the usefulness of EPCs to mobilise and access co-financing options is crucially important. As findings show, EPCs are used by certain commercial banks as tools to verify the energy savings and meet the requirements of the financial instruments. However, low confidence level in the EPC quality and their varied use across partner countries weakens the application of EPCs in incentive programmes. Even within a country, the use of EPCs is not consistent and standardised across the building types and incentive programmes. The novelty of the iBRoad2EPC concept is that it would improve EPC quality and reliability by integrating it with the BRP.

Policy coherence, in particular the alignment of LTRSs with incentive programmes, is another aspect examined in this report. Given that the purpose of the LTRS is to guide policies, actions and financial instruments, they should clearly identify the financial programmes, fiscal measures and market incentives that are expected to achieve the renovation targets in order to effectively reach its targets. The findings show that LTRSs could improve the illustration of the interaction between these incentives, i.e. how they can reinforce and/or complement each other. The focus of incentive programmes, specific groups or building types in the LTRSs do not always build on a quantitative analysis of energy savings potential or take a thorough overview of the building stock as a baseline. While data gaps need to be acknowledged, a clear connection of the current state to the Renovation Wave and national targets and elaboration on pathway to get there would be particularly important for intended fiscal and financial measures to ensure continuity across political cycles. As already done in Portugal, better coherence can also be achieved if calls for renovation funding refer to the relevant policy such as the LTRS and the objectives to which they contribute. It should be noted that most MS submitted the last iteration of LTRS around 2020 and it may be adjusted once the proposal for the Energy Performance in Building Directive (EPBD) recast is finalised. The EPBD recast will present a window of opportunity for Member States to consider the iBRoad2EPC concept in the transposition but especially in the new version of the LTRS, likely taking shape as National Building Renovation Plan (NBRP). Thus, this reports also provides policy makers with a set of specific recommendations or best practices to integrate the iBRoad2EPC concept with the incentive programmes.

Some of the ideas that stood out were that for countries such as Bulgaria, where energy audits are required for EPCs, the iBRoad2EPC concept can streamline the audit process and make it cost-effective. Across countries, recommendations relate to better linking financing mechanisms; i.e., incentive schemes and commercial loans, and improving information provision and dissemination strategy to reach target groups more effectively, especially those living in energy poverty. Tax exemptions were seldom used in most

partner countries but demonstrate an effective incentive tool when linked to the energy class of the EPC, hereby providing an intervention point for iBRoad2EPC. On a general note, results show that funding should also consider the costs of the EPC (or integrated BRP-EPC approach as in iBRoad2EPC) itself.

To highlight other contextual factors, such as scope, target group, and accessibility that affect the effectiveness of the incentive programmes - regardless of EPC quality and usage - this report also assessed the design and implementation features of the programmes. It explored how the iBRoad2EPC concept could be used to improve these features and thus minimise contextual factors inhibiting incentive effectiveness. Through the iBRoad2EPC approach, the most common first renovation steps can be identified by Member States. This analysis could help to tailor the scope of incentive programmes to support these first steps. For instance, prioritising certain passive technological measures (EE1) over active technological measures (e.g. PV). In addition, the iBRoad2EPC can help to strengthen renovation measures by using a high-quality assessment that can help financial actors in the decision-making for preferential private financing. This is crucial for vulnerable population groups who may have limited ability to pay upfront.

Furthermore, the report highlights the impact of accessibility on incentive effectiveness. Hence, to maximise the benefits of improved EPCs/BRPs and thereby increase the rate of renovation, it is essential to enhance the accessibility of the incentive programmes. This can be achieved by investing resources in increasing OSS offers, which can serve as a means to raise awareness of the funding options and benefits of renovation – as recognised in previous iBRoad2EPC reports. iBRoad2EPC can serve as a tool that not only provides improved data on building conditions and current renovation rates, useful to public authorities, but also increases citizens' awareness of the multiple benefits of building upgrades, such as improved indoor environmental quality and health. iBRoad2EPC can act as a glue between measurable policy intention through NBRPs and tailored funding streams for homeowners and public authorities, as well as increasing the urgency for OSS and awareness-generating measures.

In conclusion, the integration of iBRoad2EPC - the with BRPs enhanced EPCs - into these financial and non-financial incentive programmes could improve their effectiveness by (1) prescribing clear guidelines to public administration on what renovation interventions should be incentivised with priority, (2) tying the exact amount of funds to specific and measurable energy improvements, and (3) providing building owners with clear, reliable and actionable information, thus making renovations more accessible.

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ABBREVIATIONS

ACE	Architects' Council of Europe
AFM	Environmental Fund Administration (Romania)
BRP	Building Renovation Passport
DBL	Digital Building Logbook
DHS	District Heat System
DHW	Domestic Hot Water
ESCOs	Energy Service Companies
EED	Energy Efficiency Directive
EEI	Energy Efficiency Index
EEM	Energy efficient mortgage
EE1	Energy Efficiency First
EPBD	Energy Performance of Buildings Directive
EPC	Energy Performance Certificate
ETEAP	Energy Efficiency National Fund (Greece)
EU	European Union
FTiR	Thermomodernisation and Renovation Fund (Poland)
GHG	Greenhouse Gas
HOA	Housing Owner Associations
ICO	Official Credit Institute
IFFRU	Financial Instrument for Urban Rehabilitation and Renewal
KPI	Key Performance Indicator
LTRS	Long-Term Renovation Strategy
MEPS	Minimum Energy Performance Standard
MFB	Multi Family Building
MS	Member States
NAC	National Advisory Committee
NBRP	National Building Renovation Plan
NECP	National Energy and Climate Plan
NGEU	Next Generation EU
NRRP	National Recovery and Resilience Plan
OSS	One Stop Shop

ERRP	Programmed renovation residential environment
RRF	Recovery and Resilience Facility
RTRP	Recovery, Transformation and Resilience Plan
SFB	Single Family Building

1. INTRODUCTION

Background and context

EPCs were introduced in 2002 via the first Energy Performance of Buildings Directive (EPBD) under article 11-13 (currently under recast) and have been implemented in each MS, though with varying degrees of success. Previous iBRoad2EPC[1] reports show that in each of the six partner countries – Bulgaria, Greece, Poland, Portugal, Romania and Spain – EPCs are integrated into LTRSs. However, as is acknowledged through the Next Generation EPC cluster of Horizon 2020,[2] there is still untapped potential for EPCs to create demand for energy efficiency and trigger deep renovation in buildings – for example, by improving decision-making criteria based on energy performance in real-estate transactions, or by incorporating recommendations for the cost-effective or cost-optimal upgrade of energy performance. The continuous improvement of their design, visibility, reliability, usefulness and implementation is essential to increase homogeneity across the EU, to spend public money aimed at incentivising renovation rates more effectively, and ultimately to improve the energy performance of the EU building stock.

BRPs provide customised roadmaps for deep renovation. Some LTRSs already identify BRPs as a key policy instrument, or at least refer to them. The iBRoad2EPC project funded through Horizon 2020 and running from 2021-2024 has as its primary objective to connect Building Renovation Passports (BRPs) with Energy Performance Certificates (EPCs). It builds on the iBRoad project[3] (2017-2020) that developed, tested and delivered a model for BRPs to support single-family homeowners with personalised advice to facilitate stepwise deep renovation. Since iBRoad, BRPs have been gaining more visibility as a tool to stimulate renovation across Europe (e.g. the European Parliament's amendment to the EPBD proposal). iBRoad2EPC aims to enhance the format of EPCs by integrating BRPs and broadening their scope to include multi-family and public buildings. Furthermore, the project aims to improve the reliability, usefulness and effectiveness of EPCs – as such, it has recognised the benefits of a better integration of EPCs and BRPs, providing a practical and effective tool to assist MS in accelerating the EU Renovation Wave, and thereby reducing pressure on energy supply.

The iBRoad2EPC concept[4]

iBRoad2EPC clusters its activities around four main pillars: (1) assess the needs, potential and practicability of merging the EPC with the BRP; (2) adapt the iBRoad concept to become part of EPCs; (3) test and evaluate the applicability of iBRoad2EPC in six countries (Bulgaria, Greece, Poland, Portugal, Romania and Spain), including training for auditors and EPC issuers; and (4) facilitate the adoption and exploitation of the iBRoad2EPC model across Europe.

A previous project report[5] has identified the availability of and access to finance as a key barrier to achieving high renovation rates. This emphasises the importance of financial and non-financial incentive programmes to accelerate renovation rates in the EU. To facilitate the adoption and exploitation of the iBRoad2EPC model across Europe, this report focuses on assessing and addressing this key barrier and provides recommendations for overcoming it through the iBRoad2EPC concept.

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[1] EPCs – Energy Performance Certificates & LTRSs – Long-Term Renovation Strategies – Horizon 2020 iBRoad2EPC project

[2] Next Generation Energy Performance Certificates cluster (europeanenergyinnovation.eu)

[3] iBRoad Project – Individual Building Renovation Roadmaps (ibroad-project.eu)

[4] For detailed information, please rerefer to iBRoad2EPC in depth – Horizon 2020 iBRoad2EPC project

[5] Conceptualising iBRoad2EPC – Horizon 2020 iBRoad2EPC project

Objectives of this report

The aim of this report is to assess the use of financial and non-financial incentives for renovation in the implementing markets of each partner country, their alignment with national LTRSs, and the use of EPCs in these incentive schemes to support large-scale and deep renovation. Furthermore, it examines whether and how the iBRoad2EPC concept can be integrated into these incentive programmes to contribute to triggering renovation, identifies opportunities, and makes recommendations for its adoption.

Given the potential of an integrated EPC-BRP approach as developed in iBRoad2EPC, the regulatory frameworks should support rather than inhibit its roll-out. The usefulness of this report lies in its identification of existing gaps but also incentives in the policy landscape of implementing countries that can either serve as impeding factors or best practice. Beyond the cost of renovation, incentives should also address the financial barriers to obtaining EPCs enhanced with BRP elements. Such enhanced EPCs may entail extra costs due to mandatory on-site visits and in-depth analysis, which may not be necessary or common practice for regular EPCs.

Methodology

This report primarily relies on information provided by partner countries regarding financial incentive schemes and their expert assessments. Experts from consortium partners in all six partner countries were asked to provide written responses to a wide range of questions: they were asked to elaborate on key financial and non-financial incentive programmes in their country (at least two programmes per country), to qualitatively assess their design and implementation, to consider the relevance of EPCs for these programmes, to assess policy coherence with the national LTRS, and to share observations on the state of implementation of iBRoad2EPC in the national policy framework.

To highlight other contextual factors that impact the effectiveness of the incentive programmes - independently of EPC quality and its use - this report does evaluated general design and implementation features of incentive programmes and how the iBRoad2EPC approach could support their improvement. However, this report does not provide a comprehensive analysis of all incentive schemes (past, current, or proposed) found in the LTRS and beyond.

Structure

The report is structured as follows. It introduces the iBRoad2EPC project in Chapter 1. Then the relation between the EPCs and inventive programmes, the incentive programmes and the LTRSs, and the opportunities for integrating the iBRoad2EPC concept with various incentive programmes are studied in Chapters 2, 3 and 4. Chapter 5 presents themes and factors that determine the success of the incentive programmes independent of the EPCs. Finally, the key findings from Chapters 2 to 5 are used to make recommendations for the integration of the iBRoad2EPC concept in the design and implementation of new financial and non-financial incentives for building renovation. The focus of this report is to understand and highlight how the iBRoad2EPC concept can assist in formulating efficient incentive schemes linked to EPCs and BRPs.

2. ANALYSIS OF THE USE AND EFFECTIVENESS OF EPCs IN INCENTIVE PROGRAMMES

The long-term relevance of iBRoad2EPC lies in the contribution it will make to doubling renovation rates across the EU over the next decade, thereby supporting the implementation of the Renovation Wave strategy. Currently, although all MS have a mandatory LTRS, approaches to incentivising renovation rates vary considerably. While previous iBRoad2EPC reports (*Summary analysis of EPCs' alignment with national Long-term renovation strategies*[6] and *Conceptualising iBRoad2EPC: can EPCs be upgraded to include Building Renovation Passport elements?*[7]) have shown that EPCs are a key instrument in all partner countries, they are implemented with different levels of scope and ambition. As financial and non-financial incentives are key triggers for renovation activities, it is important to investigate how EPCs can contribute to their success.

Overview of incentive programmes by country

Before diving into more granular country insights in 2.2, Table 1 gives a general overview of incentive programmes in partner countries. More details can be found in Annex 1. What is clear is that most countries have varying and sometimes complementary financial incentives. Key financial incentives include, grants, subsidies, tax exemptions. They provide direct financial assistance towards the cost of renovation. Key non-financial incentives include credit guarantee scheme, one-stop-shops (OSS) and other. They improve the access to finance and increase awareness on renovation. In general, more financial than non-financial incentives were identified. Financial incentives in particular can be depleted quickly, so that the programmes presented below might be outdated soon after the publication of this report in November 2023.

Table 1: Overview of incentive programmes in the six iBRoad2EPC partner countries

Country	Name of the incentive	Type of incentive	Brief description
Bulgaria	Support for Sustainable Energy Renovation of the Residential Building Stock Phase II [ПОДКРЕПА ЗА УСТОЙЧИВО ЕНЕРГИЙНО ОБНОВЯВАНЕ НА ЖИЛИЩНИЯ СГРАДЕН ФОНД] for Multi-family building (MFB) owners in cities	80% subsidy 20% co-financing	For SFB, municipalities apply in partnership with HOAs registered under the same law. After the implementation of energy saving measures (ESM), buildings should achieve energy class B and a minimum of 30% primary energy savings.) The total budget is BGN 282,470,400 including VAT.
	Regional Development Programme 2021-2027 [Програма "Развитие на регионите" 2021-2027] for owners of MFB and Single-family buildings (SFBs)	Subsidy	Funding will be based on Territorial Strategies developed under the responsibility of Territorial Authorities (10 municipal administrations) and the 6 Integrated Territorial Development Strategies for Level 2 Planning Regions focusing on the 40 municipalities developed under the responsibility of the Regional Development Council in the NUTS 2 region concerned, which will perform functions related to the pre-selection of project ideas. For financial instruments the budget is EUR 236.2 million, of which EUR 141.7 million is for financial instruments and EUR 94.5 million is for grants in one operation with financial institutes.

[6] EPCs – Energy Performance Certificates & LTRSs – Long-Term Renovation Strategies – Horizon 2020 iBRoad2EPC project

[7] Conceptualising iBRoad2EPC – Horizon 2020 iBRoad2EPC project

	'Immovable Property Tax' [Данък върху недвижимите имоти] for buildings	Tax exemption	This exempts from taxation buildings put into operation before 1 January 2005 of energy class B, and buildings put into operation before 1 January 1990 certified with class C, issued in accordance with the Energy Efficiency Act and the Regulation under Article 48 of the Energy Efficiency Act. Not applicable when renovation works are implemented with public funding.
Greece	SAVING [Εξοικονομώ] 2023 scheme	Subsidy	For thermal modernisation interventions of home owners. The total budget for the 2023 cycle is EUR 300 million. It includes public funding of between 40% and 75% of the cost of energy improvements, depending on the income of the beneficiary and whether the property is owner-occupied or rented.
	SAVE-RENOVATE scheme for young people [Εξοικονομώ - ανακαινίζω το σπίτι μου - για νέους]	Subsidy	Specifically for people born after 1984 to cover renovation works: between 40-85% of the cost for energy savings, and 30% cost coverage for renovations. The total budget is EUR 300 million.
	ELECTRA [ΗΛΕΚΤΡΑ] scheme for public buildings	Subsidy	For public authorities that are using buildings for healthcare, education, offices and other types of public buildings such as cultural, athletic facilities, museums, buildings used by religious authorities etc. The total budget for this cycle (expected to close at the end of 2025) is EUR 640 million. Public funding is provided in the form of a grant ranging between 50-95% of the eligible energy upgrade costs (the higher percentage is foreseen for buildings that achieve greater savings in the end).
Poland	Warm Flat [Ciepłe mieszkanie]	Subsidy	For SFB owners to replace solid fuel heating sources and improve energy efficiency. Subsidy amount depends on income level with part of the budget reserved for communities. The second phase has been opened in late 2023 with a budget of nearly PLN 63 million.
	Clean Air [czyste powietrze] programme	Subsidy and loans	This aims to improve air quality, change heating sources and improve energy efficiency. It has a budget of PLN 83,300,000 and PLN 20 billion as loans.
Portugal	Efficiency Voucher [Vale Eficiência] programme	Subsidy	Funding is accessed via an online platform and offers vouchers for beneficiaries of social electricity energy tariffs for measures of a maximum value of EUR 1,300. The overall budget is EUR 32 million.
	Support Programme for More Sustainable Buildings [Programa de Apoio a Edifícios mais Sustentáveis]	Subsidy	A subsidy for owners of residential buildings based on a reimbursement procedure. Costs are paid upfront. Up to 85% of costs can be covered, depending on the measure. The total budget is EUR 195 million with a recently opened new injection of EUR 30 million.
	Support programme for Multifamily Buildings [Programa de Apoio a Condomínios Residenciais]	Subsidy	A subsidy for owners of MFBs and condominiums, financial capacity for the non-funded part needs to be proved. The budget is EUR 12 million, with a maximum of EUR 150,000 per application (funding covers 70% of the cost for traditional solutions and 80% for eco-materials).

Romania	Energy Efficient House Programme [Casa Eficienta Energetic]	Subsidy for single family home	Public funding of 40-60% (based on energy performance targeted, on one of three levels) but not more than EUR 8,000 (minimum level) to EUR 14,100 (maximum level) for SFBs.
	Energy efficiency in public buildings [Eficiență energetica în clădiri publice]	100% grant	Energy efficiency funds for moderate to deep renovation measures including, thermomodernisation, change to efficient heating systems, installation of renewable energy systems and charging stations.
Spain	Programmed Renovation Residential Environment (ERRP) [Programa de ayuda a las actuaciones de rehabilitación a nivel de barrio]	Subsidy	Renovation programmes for the economic and social recovery of residential environments. Target is subdivided into three sub-programmes: i) existing multi-family buildings located in an ERRP; ii) multi-family buildings; and iii) SFBs.
	Programme for the Energy Renovation of Buildings (PREE) [Programa Rehabilitación energética de edificios]	Subsidy	This programme provides access to finance for the implementation of renovation measures such as the improvement of the thermal envelope, the replacement of fossil fuel based heating systems with biomass, geothermal, solar thermal and heat pump systems, the generation of renewable electricity for own consumption and the installation of efficient regulation and control technologies, as well as energy efficient lighting. In addition, the programme aims to support actions carried out by Renewable Energy Communities or Citizen Energy Communities and provides special support for vulnerable groups.
	Programme for the Regeneration and demographic challenge (PREE 5000) [Rehabilitación energética de edificios en municipios de reto demográfico]	Subsidy	The programme aims to boost sustainable buildings in municipalities with up to 5,000 inhabitants which face demographic challenges. Interventions can range from changes of thermal envelop, replacement of heat sources but even energy efficiency lighting. The programme also aims to promote action carried out by renewable energy communities. Additional aid is given to owners that are granted a social bonus to tackle energy poverty.
	Programme to Promote the Renovation of Public Buildings (PIREP) [Programa de Impulso a la Rehabilitación de los Edificios Públicos]	Subsidy	This programme is financed under the Recovery and Resilience Facility (RRF) and aims to renovate at least 1,230,000 m^2 of public buildings and achieving a 30% primary energy reduction. Measures cover improvement of water, materials, waste and climate adaptation, accessibility of buildings, removing of hazardous materials inside, and conservation of buildings. It is aimed at municipalities and local councils.
	OPENGELA	One-stop-shop	The one-stop-shop helps building owners to overcome the initial barriers to renovation, acts as a contact point in the district, centralises renovation support measures and is complemented by official communication campaigns.
	ICO MITMA Rehabilitation of Residential Buildings	Credit guarantee scheme	Creation of financing instruments, through an agreement between the Ministry of Transport, Mobility and Urban Agenda and the Official Credit Institute (ICO), aimed at communities of owners to favour the renovation of their buildings, since they may have difficulties in finding such financing through ordinary channels.

Best practice 1

Spain has adopted strategies to supplement public financial measures by partnering with private financial actors. The aim is to enhance financing for renovation projects via the guarantee lines of the Official Credit Institute (ICO). Financing tools were established via an agreement between the Ministry of Transport, Mobility and Urban Agenda and the ICO to aid communities of owners with the renovation of their properties, as regular financing channels may pose challenges. This scheme aims to assist the general public and, more specifically, homeowners' associations. The main target groups that benefit from this policy are individuals and households with limited financial resources, who often face difficulties in obtaining funding for the renovation or improvement of their housing stock.

Best practice 2

The Spanish OPENGELA OSS model aims to centralise all administration and procedures associated with the integrated renovation of apartment buildings, including administrative paperwork, liaising with energy service contractors and offering financial aid. The model is supported by additional tools designed to promote renovation, such as manuals and guides covering various aspects of energy renovation, along with forums, observatories, and working groups; and a web platform that is targeted at companies and agents within the sector providing an inventory of best practices in the field of energy renovation. In addition, specific information and communication campaigns will be carried out, which could include campaigns for the establishment of regional or local renovation offices.

Country insights

The following sub-chapters demonstrate findings from a survey of the incentive schemes (see Annex 1 for a description of the schemes) conducted with experts from the consortium partners in each participating country.

Bulgaria

Most policies and programmes relevant to building renovation foresee a limited role for EPCs. The latest renovation programme (under the national recovery and resilience plan (NRRP)) has one positive feature, in that the criteria for the amount of energy savings have been increased, although buildings achieving higher energy savings are not given any preferential treatment. That is, there are no additional incentives for achieving high energy savings, except that buildings which could do so are given priority in applying for the incentive programme. For example, in the programme 'Sustainable Energy Renovation of the Residential Building Stock – Phase II', there is a requirement to issue an EPC prior to the renovation work. However, given the current design of the renovation programmes (phase I was 100% grant-funded), EPCs are not really considered – they are additional expenses for the owners, who must pay for them, and there are no incentives around them. For various reasons, class G MFBs (which have a high potential for achieving energy savings) only form a miniscule portion of the programme that uses grant assistance from public funds to cover 100% of renovation and administrative costs.[8] For fiscal schemes, such as tax exemptions, EPCs play a central role. Exemption from taxes on immovable property is provided for buildings commissioned prior to 1 January 2005 which possess an EPC with an energy efficiency rating of B, C or D.[9] However, it is believed

[8] bg_ltrs_2020_en_version_0.pdf (europa.eu)

[9] CA-EPBD-IV-Bulgaria-2018.pdf (epbd-ca.eu)

that this tax exemption scheme has only a limited effect on the usage of EPCs for this purpose, due to a lack of public awareness. Furthermore, EPCs are used by certain commercial banks as tools to verify energy savings to meet the requirements of the financial instruments the banks offer. However, this has limited impact compared to the state-led renovation programmes that give high grants.

Key messages from Bulgaria

- In practice, EPCs are not used widely in financial incentive programmes because their cost is borne by the building owner (in Bulgaria, EPCs can only be obtained after an energy audit and are expensive).
- In fiscal schemes that offer tax exemptions, EPCs must be provided as evidence.
- EPCs are used by certain commercial banks as tools to verify whether energy savings meet the requirements of their financial incentive programmes.

Greece

EPCs are an integral part of most financial incentive schemes for building renovation. For instance, the 'SAVING' programme (national energy upgrade scheme for residential buildings) mandates that buildings must achieve primary energy savings of at least 30%, and a minimum improvement of three energy classes. They also validate the significant energy saved in buildings under the programme. EPCs are utilised in a similar manner within the 'Save-Renovate' financial scheme for young individuals, a component of the 'SAVING' programme. Additionally, the 'Save-Renovate' scheme covers the expenses incurred for the issuance of the EPC and the digital building identity (i.e. a digital cadastre). Similarly, EPCs are vital to the success of the 'ELECTRA' programme, which aims to upgrade public sector buildings to a minimum energy rating of class B, and to achieve a 30% reduction in annual primary energy consumption and in greenhouse gas emissions. Furthermore, EPCs assist in identifying and prioritising the worst-performing buildings during the application process for most of these programmes.

Key messages from Greece

- EPCs are mandatory for all incentive programmes; EPCs should demonstrate primary energy savings of at least 30%, and a minimum improvement of three energy classes.
- EPCs assist in identifying and prioritising the worst-performing buildings.

Poland

Poland's incentive programmes focus on replacing heat sources, improving air quality and improving energy efficiency. EPCs are a key component of the financial incentives 'Clean Air' for SFBs and 'Warm Flat' for MFBs. For the latter, the progress of modernisation is determined on the basis of EPCs. EPCs are required to receive reimbursement of the renovation costs through the incentive schemes. This is particularly the case for the 'Clean Air' programme, where the owner has to perform a building energy audit with the issuance of an EPC to create a claim for reimbursement: it is quite commonly used to verify energy savings.

Key messages from Poland

- EPCs are mandatory for receiving financial incentives.
- EPCs are used to verify energy savings from renovation.

Portugal

In Portugal, the 'Support Programme for More Sustainable Buildings' and 'Efficiency Voucher' programmes are significant funding schemes. EPCs do not play a specific role in the incentives, but they are mandatory in cases where technical assistance is provided by a certified energy auditor during the application process (experts estimate this to be a negligible proportion of total applications). The financial programmes aiming at active technological measures (e.g. heat pump replacement) *and* passive technological measures (e.g. thermomodernisation of the building envelope) tend to be allocated more towards active measures (63% of eligible applications). However, there is a possible point of intervention regarding EPCs, where a stronger reliance on their recommendations can lead to a prioritisation of passive measures, in line with the Energy

Efficiency First (EE1) principle. First steps were made under the adjusted voucher programme, where interventions were given three levels of priority: 1 – efficient windows, 2 – domestic hot water class A minimum with renewable energy sources (heat pumps included), and 3 - heating/cooling systems class A minimum with renewable energy sources (heat pumps included) and PV panels. An expert cannot suggest measures on levels 2 or 3 if there is investment to be made under level 1. This clearly addresses previous concerns over passive measures not being prioritised (although wall insulation is not included in the package).

For assessing the success of implementation of the incentive programme, the EPC database was used to determine overall impact of the proposed renovation measures across the programme, rather than at the building or application level. EPCs are mandatory for access to funding programmes for owners of non-residential buildings, both public and private. However, it should be noted that a mandatory EPC, if not properly financed, may act as a potential barrier to funding mechanisms, especially on smaller investments. For a successful application, non-residential buildings should achieve a minimum primary energy reduction of 30%, which can be verified using the EPC both before and after the renovation. EPCs are also an integral part of the Urban Rehabilitation and Revitalisation scheme (IFFRU), and support monitoring at the application/building level as it is mandatory to achieve an improvement of two energy classes before and after the intervention. In addition to their role in tracking eligibility measures, the EPC database and tools linked to the EPC scheme – such as the casA+ simulator – also serve as a source of information and as proxy for monitoring and impact evaluation for the programme as a whole, especially relating to reductions in primary energy demand.

Key messages from Portugal

- EPCs are mandatory for incentive schemes for public and private non-residential buildings; EPCs must demonstrate at least 30% primary energy reduction.
- EPCs are optional for incentive schemes for residential buildings in some programmes.
- EPCs are mandatory (improvement of at least two energy classes) in some incentives related to residential buildings in urban renewal areas.
- The EPC database and related tools are key for monitoring and impact evaluation of the programmes e.g. they reveal that the subsidy rate for passive technological measures has increased significantly following recommendations.

Romania

In Romania, the energy performance of a building is assessed by calculating the energy demand and CO_2 emissions which result from operating the building: these are documented through the EPC, which is thus a critical document for assessing and reporting the impact of renovations. An EPC is required for the building state before the renovation (together with the energy audit report), and a new EPC is required for the renovated building after all the works are finalised. The impact of renovation is assessed based on the difference between the before-renovation EPC and the final EPC. This is mandated for various financial schemes for renovation in single-family, multi-family and public buildings.

For the continued 'Energy Efficient House' programme run with RePowerEU funds – for which the first contracts are due to be signed by September 2024 – beneficiaries can only access finance if they have an EPC (class G-E) for the building to be renovated, obtained in the last three months.

Key messages from Romania

- EPCs are mandatory to access finance in most incentive programmes.
- EPCs are used to assess the impact of renovation.

Spain

In Spain, EPCs are used as the main tool to certify the energy performance of a building before and after renovation in a group of programmes funded by Next Generation EU (NGEU) under the Housing Renovation and Urban Regeneration Plan. In addition, the amount of funding is linked to the non-renewable primary

energy saved and therefore to the improved energy class, with three thresholds: reductions in energy use of 30%, 45% and 60%. The current EPC calculation system is under review to adapt the scaling to criteria that strictly reflect the desirability of an energy saving investment, and to bridge the gap between calculated and measured final energy consumption. EPCs are also at the heart of key financial and non-financial incentive programmes such as the Operational Model or funds accessed under the Recovery, Transformation and Resilience Plan (RTRP).

Key messages from Spain

- EPCs are required before and after the renovation for most incentive schemes.
- The amount of funding is linked to the improvement in the energy class of the EPCs.
- The quality of EPCs needs to be improved and the EPC calculation system is under review (National Energy and Climate Plan 2023).

3. ANALYSIS OF ALIGNMENT OF INCENTIVE PROGRAMMES WITH LTRSs

MS are required to develop an LTRS under article 2a of the EPBD, which outlines a decarbonisation trajectory for the building sector through to 2050. More specifically, Article 2a(3) of the EPBD requires MS to create financial mechanisms to support mobilisation of investments in the renovation. Given that its purpose is to guide policies, actions and financial instruments, the LTRS[10] provides an opportunity to clearly identify the financial programmes, fiscal measures and market incentives that are expected to achieve renovation targets. Ideally, the LTRS should illustrate the interaction between these incentives, and make it clear how they can reinforce and/or complement each other. Their design should build on the analysis of energy savings potential and needs, as well as on the overview of the building stock, to justify the focus of incentive programmes, specific groups or building types. This is particularly important for fiscal and financial incentives to ensure continuity across political cycles, and thereby to ensure that the objectives of the European Renovation Wave Strategy and national targets can be achieved. For overall coherence, calls for renovation funding should refer to the relevant policy (such as the LTRS) and the objectives to which they contribute. It should be noted that most MS submitted the last iteration of their LTRS around 2020, and ongoing adjustments will likely be made once the revised EPBD is finalised.

In another iBRoad2EPC report, namely *Summary analysis of EPCs' alignment with national Long-term renovation strategies*,[11] a detailed analysis of each country's LTRS was provided. On the basis of this and other previous findings, the aim of this chapter is to examine the degree of policy coherence between the LTRS and the incentive schemes currently in place. With this background knowledge, opportunities to integrate the iBRoad2EPC concept into incentive programmes (see Chapter 4) can be linked better to the concrete policy context in which they are embedded.

Bulgaria

The **Bulgarian LTRS** outlines several priorities for 2021-2030, such as the development of the Energy Efficiency Obligation Scheme (originally from 2017, also mentioned in the Energy Efficiency Law implementing the EU Energy Efficiency Directive), and an instrument to mobilise private investment through energy efficiency, for example through municipal/national guarantee schemes or green mortgages. Also mentioned is the energy efficient mortgage (EEM),[12] which was implemented via the banking and insurance KPC group. This is another instrument which allows the applicant a higher loan amount or more lenient financial terms (e.g. low rate of interest and fees) if they implement energy efficiency measures. Furthermore, the structuring of a national decarbonisation fund is expected to increase access to financial instruments for energy renovation, but this reform is currently delayed and is not expected until 2024 at the earliest.

The LTRS also sets a strategic objective to ensure that sustainable financial instruments are available to enable its implementation. It specifies that funding with 100% coverage of cost would create unrealistic expectations: *"it would not be sustainable and would generate expectations at levels similar to those of open-ended grant funds. It would also not create a culture where building owners have to take responsibility for their buildings, but would rather generate the expectation that the Government remains responsible." (p.93)*. For the 'Support for Sustainable Energy Renovation of the Residential Building Stock - Phase II' programme (see Annex 1), it was found that there was a high level of interest in the incentive, but that the high funding rate (80% in this case) indeed created unrealistic expectations and was not sustainable in the long term. As is outlined in the LTRS and agreed by country experts, there should be different support

[10] With the recast EPBD, MS will likely be expected to update their LTRS to NBRP

[11] EPCs – Energy Performance Certificates & LTRSs – Long-Term Renovation Strategies – Horizon 2020 iBRoad2EPC project

[12] Mortgage loan for Energy Efficient Home | United Bulgarian Bank (ubb.bg)

schemes for different social groups. There was an initial expectation that the national decarbonisation fund would provide various financial instruments to assist households towards the 20% self-financing of phase II of the programme, including for energy-poor households. The call for project proposals is currently running with a deadline of January 2024, however, without the decarbonisation fund having been established.

Strategic objective 3 of the LTRS already calls for the development of administrative and technical capacity for the implementation of programmes on housing stock renovation through the provision of technical assistance to central governmental bodies and local authorities. One of the axes of the 'Regional Development Programme 2017-2027' was to extend assistance to increase administrative capacity at local and national level. However, in practice, municipalities are in charge of administering the procedure, yet they receive no financial or technical support.

A barrier that the LTRS identifies is the low creditworthiness of owners' associations due to a lack of assets that can be used as collateral: this is a barrier to the market funding of the renovation of many multi-family buildings. The intention was to address this by developing a financial instrument for risk sharing, which would encourage banks to enter this market, and to provide collective loans before 2030. This has not yet happened.

Greece

The **Greek LTRS** provides a wide range of financial incentives in the public, residential and tertiary sectors. In its chapter 5.3.2, the LTRS aims to adjust the operating framework by streamlining incentives to maximise energy benefits while focusing on vulnerable households – which is reflected in the design and target group of these incentives (see also Annex 1). The 'Electra' and 'SAVING' programmes are also mentioned in the LTRS. Furthermore, it outlines the future establishment of the Energy Efficiency National Fund (ETEAP) which aims to *"make investment more attractive, available funds may be used to subsidise part of the cost of the programme or to further enhance the terms of financing the loans granted to energy carriers." (p.40)*. The vision is for blended funding to cooperate with the domestic financial sector and mobilise private financing on favourable terms, e.g. blended concessional loans, guarantee instruments etc. EPCs are identified as an instrument to mitigate technical and financial risk. The loan system to complement public funding – state guaranteed and interest-free for applicants – works well. The 'SAVING' programme aimed at young people (born 1984-2005 and under the specific name 'SAVE/RENOVATE') was introduced in May 2023 and therefore not mentioned in the LTRS. However, country experts believe it is designed to contribute to the NECP target of renovating 60,000 housing units annually until 2030.

The LTRS mentioned that *"to achieve the above goals, ongoing information and awareness actions are needed, along with significant (economic, town planning, tax) incentives" (p.64)*. However, no tax incentive is mentioned anywhere else, neither are details on town planning. A tax incentive was established in 2020 (and will be valid until the end of 2024) through which people renovating their house can receive tax exemption for up to 40% of the costs, with a maximum of EUR 1,600 per year for four consecutive years). Furthermore, there is also a new measure in place where owners who legalise their buildings (illegal or without permit) can receive a discount of up to 50% of the fine they have to pay and instead use the money for energy efficiency and structural upgrades.

In the **Greek** NRRP that was endorsed by the European Commission in 2021, 13.3% of funding is allocated to building energy renovation, with 39% going to residential buildings, 10% to the public sector and 51% to industrial and commercial. An assessment by Renovate2Recover[13] states that the relationship between the NRRP funds and other public funding sources has not been elaborated in detail, so there seems to be room for improvement.

[13] Renovate2Recover-GREECE.pdf (renovate-europe.eu)

Poland

The **Polish LTRS** from 2022 has an extensive chapter on financial tools. Poland links the energy renovation of buildings with the reduction of air pollution. The LTRS mentions the 'Clean Air' programme, targeted at the renovation of the houses of people affected by energy poverty. Municipalities carry out the renovations and pay 30% of the cost, while the other 70% is covered by the state via the Thermomodernisation and Renovation Fund (FTiR). The LTRS identifies this programme as the oldest continuously functioning tool to support energy efficiency in Europe, along with the FTiR, with beneficiaries ranging from municipal buildings to housing cooperatives. It achieved cumulative savings of more than PLN 1,000 million in 2020 (p. 73). An amendment to the 'Act on Support for Thermal Modernisation and Renovation' came into effect in 2021, which improved the 'Stop Smog' programme by facilitating access to it and expanding the costs it covered.[14] Another key financial incentive programme is the 'Clean Air' Priority Programme of the NFOŚiGW, with one of its pillars addressing financial support for energy renovations of SFBs (which covers approximately 40% of the population)[15]. It plans to allocate PLN 103 billion (EUR 20 billion) over ten years (2018-2029) to finance the renovation of around 3 million single-family houses through non-repayable grants (PLN 63.3 billion) and loans (PLN 39.7 billion). Poland also had a 'Regional Operational Programme 2014-2020', which provided funding for the energy renovation of residential buildings in 15 less developed regions and has been continued for the period 2021-2027. Given that the LTRS was published in 2022 and includes a number of financial instruments that have been discontinued without justification or explanation, the renewal of the LTRS should specify which programmes are planned for the future and how they will combine to achieve the set targets.

One fiscal measure the LTRS mentions is the Thermomodernisation Allowance, an income tax relief (deducted from the tax base or from revenues in the case of flat-rate tax) for owners of single family residential buildings that was introduced in 2019, allowing them to claim up to 100% of expenses to a maximum of PLN 53,000. It is not aimed at alleviating energy poverty, but is designed to incentivise the Polish middle class. The problem with the allowance is that there is no requirement to submit an EPC or energy audit to prove the thermal upgrading effect.

While not directly relevant to the scope of iBRoad2EPC, the Polish LTRS covers a wider range of building types – for example, it outlines financial support for energy renovations of school buildings ('Clean Air in Schools') and buildings related to care, education, religion and culture ('energy efficient construction'), showing an awareness of how different programmes can complement each other.

In terms of non-financial incentives, the LTRS outlines ways to assist investors in financing the renovation of existing buildings, including "popularising the one-stop-shop (OSS) formula". It recommends that pilot regional OSS networks should be set up to provide technical assistance to councils and building owners, and lists the requirements for this to be effective. The 'Warm Flat' priority programme mentioned above is not yet included in the LTRS as it is still relatively new, starting in 2022.

It should be noted that the LTRS is not regarded as effective by the country expert consulted on Poland. They express concerns about its priority on the political agenda and its lack of specific guidelines, legal sanctions and legitimacy among the public. As *Summary analysis of EPCs' alignment with national Long-term renovation strategies*[16] already highlighted, it does not include any target for the full decarbonisation of the building sector.

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[14] Poland_Report-NC8_BR5_27dec2022 (1).pdf (unfccc.int)

[15] Energy_Poverty__Unfit_Housing_in_Poland.pdf (feantsa.org)

[16] EPCs – Energy Performance Certificates & LTRSs – Long-Term Renovation Strategies – Horizon 2020 iBRoad2EPC project

In the Polish NRRP around 19.7% of funds are allocated to building-related activities, with 10.7% of total funding being earmarked for renovation.[17] Of this, 83% is meant for the residential sector. An analysis by Renovate2Recover identified that there is a lack of consistency between different support schemes, separate treatment of heat and energy efficiency measures, and challenges around mobilising private funding. Furthermore, it lacks technical details and measurable targets. However, the LTRS does make general remarks about EU funding being channelled for example into the 'Clean Air' programme, supporting SFBs, or the FTiR.

Portugal

The first area of intervention listed in Portugal's LTRS is actions geared to create a financial framework to support building renovations. A monitoring report from 2021 provides a long list of actions that created specific funding lines for energy renovation, revised existing building renovation programmes, promoted loans to leverage private investment, and mobilised mixed financing, among others[18]. On the non-financial side, it mentions the simplification and digitalisation of licensing processes and the reduction of bureaucracy as key priorities. Policy objectives also include increasing comfort and identifying vulnerable groups to support through specific programmes. The 'Efficiency Voucher' programme is an example of this.

As is recommended by the LTRS, priority in the development of financial mechanisms is being given to 'Urban Regeneration Areas', in which municipalities have the mandate to define the location, criteria and intervention strategies to improve deteriorating buildings, infrastructure or urban areas. In line with the EE1 principle, the LTRS clearly identifies priorities for renovation by addressing passive design measures to first achieve basic levels of indoor thermal comfort. The current most successful funding mechanisms have promoted active technological measures as a first step, which could undermine the potential for a holistic building renovation. This issue has been identified in the evaluation reports and will be addressed in future funding mechanisms. The LTRS also has a policy goal to create an OSS to engage citizens: a virtual OSS has been established, managed by ADENE.

Romania

The Romanian LTRS from 2020 envisages merging various programmes into a single National Building Renovation Programme with measures for different market segments. It outlines the country's ambition to move away from subsidies to other financial schemes such as co-financing. It also provides an overview of intermediaries such as banks that can help with co-financing, and local authorities that can borrow on behalf of building owners (e.g. in the case of MFBs). It plans to have four OSS by 2030, none of which have yet been implemented.

The LTRS emphasises the availability of finance for socially vulnerable groups affected by energy poverty. In 2023, a continuation of the 'Casa Eficientă Energetic' programme was published with a budget of EUR 267 million and with a deadline for contracting projects in Q3 of 2024. This is based on vouchers, financed through REPowerEU and managed by the Ministry of Investments and European Projects [Ministerul Investitiilor si Proiectelor Europene]. The programme has two axes, one of which specifically targets vulnerable people while the other one is for SFBs in general. In both cases, it works with a voucher system and is applicable for energy classes E to G. It further highlights the need for the public sector to take a lead on energy renovations, with a goal of renovating 26% of public buildings by 2030.

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[17] Renovate2Recover-POLAND.pdf (renovate-europe.eu)

[18] https://www.adene.pt/wp-content/uploads/2022/01/1.o-Relatorio-Grupo-Coordenacao-ELPRE_Nov2021.pdf DGEG, ADENE, LNEC, IHRU (2021) "Estratégia de Longo Prazo para a renovação dos Edifícios - 1º Relatório de Progresso"

Romania plans to spend 8.9% of its NRRP funding on building energy renovation, with 45% of this going to public buildings and 42.3% to residential buildings. As is shown in Annex 1, the 'Energy Efficiency in Public Buildings' programme [Eficiența Energetică în Clădirile Publice] provides 100% of the funding for public buildings. Renovate2Recover[19] recommends that Romania should have a long-term financing strategy in line with the LTRS targets. There is no clear landscape of incentive programmes designed to collectively achieve the targets.

Spain

Spain's LTRS[20] has a new article that, in contrast to the 2017 version, stipulates that financial incentives for improving the energy performance of buildings "must be linked to an actual improvement" (p.104). Key financial incentives in Spain include the group of programmes covered under the 'Plan for Housing Renovation and Urban Regeneration' (component 2, NGEU) which seeks to achieve renovation levels aligned with the LTRS objectives. LTRS Measure 4.3. refers to a study of a new tax system to encourage renovation, both in the residential and tertiary sectors. At present, therefore, the tax exemption is an incentive with a simple and effective design that acts as a stimulus for renovation and corrects previous design errors that included public funds in the tax base, with a particular impact in low-income neighbourhoods applying for renovation funds. Spain aims to spend 11.2 % of its budget under the RRF[21] on building of which 75% alone are reserved for the residential sector (for comparison, Romania only spends 42.5% on residential buildings as seen in the previous sections).[22] However, country experts, found the application of the NGEU funds in Spain to be totally disconnected from the step-by-step approach to renovation envisioned by iBRoad2EPC.

As introduced in its Recovery, Transformation and Resilience Plan, Spain has also set up a preferential financing agreement[23] between the Ministry of Transport, Mobility and Urban Agenda and the ICO, aimed at communities of owners to promote the renovation of their buildings. The promotion of more private financing was mentioned in the LTRS under measure 5.2 (concerning identifying and removing barriers to private financing).

[19] Renovate2Recover-ROMANIA.pdf (renovate-europe.eu)

[20] es_2020_ltrs_en_version_0.pdf (europa.eu)

[21] Centrepiece of the NGEU, it is an instrument that provides grants and loans to MS.

[22] Renovate2Recover-SPAIN.pdf (renovate-europe.eu)

[23] 4.6. Preferred financing of the Official Credit Institute (Instituto de Crédito Oficial or ICO) - Guide to Business in Spain (ICEX)

4. INTEGRATION OF THE iBRoad2EPC CONCEPT WITH INCENTIVE PROGRAMMES

The effectiveness of incentive programmes is key to achieve high renovation rates. The following chapter explores if and how the iBRoad2EPC vision could be better integrated into the policy framework with the goal to supporting incentive programmes to unfold their full potential.

BRPs provide building owners with detailed information on the order in which renovation works should be implemented, cost of the renovation measures and the potential energy savings. [24] However, the feedback from the experts and previous project research (e.g. '*Summary analysis of EPCs' alignment with national Long-term renovation strategies,'*[25] '*Conceptualising iBRoad2EPC: can EPCs be upgraded to include Building Renovation Passport elements?'*[26] and '*Experience from other projects related to links between EPCs and the BRP'*[27]) show that BRPs are only marginally mentioned in national renovation frameworks. The Bulgarian, Portuguese, Spanish and Romanian LTRSs all mention BRPs as tools with the potential to improve information provision to building owners and to foster deep renovations. The Bulgarian LTRS mentions that BRPs could help recognise the 'green value' of energy upgrades and improve data on energy efficiency improvements (p.126).[28] The Portuguese LTRS mentions the iBRoad project as one of the actions to stimulate and improve cost-effective deep renovations in buildings[29]. Furthermore, the previous version of the National Energy and Climate Plan already included a reference to BRPs (p.90).[30]. Romania mentions BRPs and already has a BRP definition (from iBRoad) in L.101/2020, article 3 (38).[31] In its LTRS, the nature and use of the BRP are discussed more elaborately and it says that "*a deadline will be set for meeting the requirements of the deep renovation standards, accompanied by staged renovation plans that can be outlined in the EPC/BRP report" (p. 35).*[32] . In Spain, there are two unofficial reports that concern the introduction of BRPs that are mentioned in the LTRS (p. 105)[33]: The renovation challenge: the Energy Passport and other suggestions to boost the sector [El reto de la rehabilitación: El Pasaporte Energético y otras propuestas para dinamizar el sector] and PAS-E Building Passport [PAS-E, Pasaporte del edificio][34]. The later was developed by the Cíclica architecture cooperative and Green Building Council España and covers the steps to be followed to facilitate the deep renovation of buildings and help communities implement these renovations. BRPs are also mentioned throughout the document; for example under measure 7.7 which discusses improvements of

[24] Conceptualising iBRoad2EPC – Horizon 2020 iBRoad2EPC project

[25] EPCs – Energy Performance Certificates & LTRSs – Long-Term Renovation Strategies – Horizon 2020 iBRoad2EPC project

[26] Conceptualising iBRoad2EPC – Horizon 2020 iBRoad2EPC project

[27] Experience from other projects – Horizon 2020 iBRoad2EPC project

[28] bg_ltrs_2020_en_version_0.pdf (europa.eu)

[29] pt_2020_ltrs_0.pdf (europa.eu)

[30] pt_final_necp_main_en_0.pdf (europa.eu)

[31] Legea nr. 101/2020 pentru modificarea și completarea Legii nr. 372/2005 privind performanța energetică a clădirilor - Lege5.ro

[32] ro_2020_ltrs_en_version_0.pdf (europa.eu)

[33] es_2020_ltrs_en_version_0.pdf (europa.eu)

[34] PAS-E. Pasaporte del edificio

energy certifications of buildings. In Greece, BRPs are not mentioned in their LTRS. Poland only mentions a 'building energy passport' (p. 119).[35]

The following subsections describe the opportunities to integrate the iBRoad2EPC concept within the policy framework, and gives recommendations on how to do so for each partner country. These are based on the methodology explained in Section 1.3.

Bulgaria

Opportunities to integrate the iBRoad2EPC concept and potential benefits

Although the Bulgarian LTRS refers to the potential of linking the Energy Efficiency (EEI) to the BRP for residential single-family homes, BRPs have not yet been included in any regulation. An energy audit is required for an EPC to be issued in Bulgaria. This audit includes a number of measurements and obligations, procedures and documentation, which collect more information than is required to generate an EPC. The iBRoad2EPC concept can leverage the existing auditing procedure, e.g. which requires an on-site visit for the extensive data collection for the BRP, and in doing so can simplify and streamline the energy audit process. This can facilitate the work of energy auditors and make the process more cost effective. However, such a linkage between EPCs and BRPs is difficult to establish because of the recent changes in the main normative acts in the national legislation and the conservative approach of the administration towards making such linkages. The latest regulatory documents suggest that there will be no further changes in the next few years. In addition, the new calculation procedures are more complicated and therefore the audits are more expensive. There is no change in the obligations of the owners, as all the measures prescribed in the energy audit should be implemented and verified with a new energy audit one year after implementation. Due to the lack of definition of the BRP and the step-by-step approach to renovation, a complex energy audit has to be paid for by the owners one year after each step has been taken.

Financial actors currently use EPCs but do not use BRPs, and few other stakeholders understand the iBRoad2EPC concept. There is no process in place to carry out a step-by-step renovation. The main reason for this is the high grant offered by the national financial programmes: this covers up to 100% of the investment costs for the entire building renovation. Most government programmes only offer financial assistance to MFBs and public buildings; homeowners who live in SFBs are more likely to turn to banks for financing. Certain banks already offer ways to finance energy-saving measures in buildings, but these options are not very successful currently due to the high cost of the two audits owners must pay for, before and after the renovation. It is important to pay close attention to the forthcoming changes in the EPBD, which may introduce measures which help promote a step-by-step renovation approach, like minimum energy performance standards for existing buildings. This will allow stakeholders to focus on the other important aspect of iBRoad2EPC, which is the incremental upgrade to a level sufficient to meet the minimum requirements of the EPBD, avoiding a lock-in effect.

Recommendations for adopting the iBRoad2EPC concept in incentive programmes in Bulgaria

- Building owners can benefit from reduced energy audit costs and added value (stepwise refurbishment plan) by using the iBRoad2EPC concept.
- Banks can use the iBRoad2EPC (along with other relevant documents) to inform their decisions on financing building renovation measures.
- Banks would have more confidence in disbursing loans for renovation by using the iBRoad2EPC concept, even if this approach is not currently included in national legislation.

[35] PL 2020 LTRS _ EN version.pdf (europa.eu)

- Policymakers should design financial incentives with a low grant percentage and find ways to increase private funding to create the conditions for step-by-step renovation and to achieve a high renovation rate.
- Policymakers should design different support schemes for different social groups (e.g. policies addressing energy poverty).
- Building energy experts believe that MEPS for buildings (as part of the EPBD) will create the conditions for step-by-step renovation, such as those provided in the iBRoad2EPC.

Greece

Opportunities to integrate the iBRoad2EPC concept and potential benefits

EPCs are used to meet legal obligations where necessary: e.g. an EPC is issued prior to selling or renting a property and its EPC class is mentioned in advertisements, and EPCs are needed to access certain incentive programmes for renovation. Beyond that, an EPC adds little value and is not viewed as an important document for a property, implying that people are often indifferent to a building's energy class and performance. BRPs are not present in any form in the Greek policy framework and have not yet been introduced in the Greek market. Greece has an instrument similar to a Digital Building Logbook (DBL) called a Digital Building ID (i.e. a digital cadastre) [Ηλεκτρονική Ταυτότητα Κτιρίου – HTK], which certifies the legal state of a property. This is required after an owner has submitted the application for the incentive programme but before receiving its approval of the project from the Ministry. It was found that building engineers understand the potential of the iBRoad2EPC concept (mainly for large buildings) because they appreciate the importance of planning building works in advance to achieve good results. However, other stakeholders are in need of a better understanding of these instruments. BRPs could potentially be linked with the national energy upgrade schemes and the Digital Building ID, which is currently only accessible as a platform by engineers. iBRoad2EPC could also fit well into an OSS scheme or into Energy Efficiency (Performance) Contracts, and has good scope to assist banks and energy service companies (ESCOs) in assessing funding applications, or real estate companies in the programming and estimation of renovation costs.

Recommendations for adopting the iBRoad2EPC concept in incentive programmes in Greece

- Energy experts are of the opinion that they should be paid more than they currently are for issuing the necessary permits (including EPCs) and for the administration of applications for incentive schemes. However, policymakers should find ways to reduce additional costs of higher quality EPCs/BRPs to minimise the burden on the building owner.
- Policymakers should aim to present different instruments (e.g. EPCs, iBRoad2EPCand BRPs) to each stakeholder group, explaining their scope and benefits, following the example of such activities in the context of the Greek National Advisory Council (which includes representatives from the financial sector). This would provide a first step towards integrating the iBRoad2EPC concept into incentive schemes.

Poland

Opportunities to integrate the iBRoad2EPC concept and potential benefits

Currently, stakeholders are less aware of BRPs and other similar instruments. There is a need for the ministry to develop familiarity with the iBRoad2EPC concept. Although many stakeholders believe the iBRod2EPC project has great potential, there is also a scepticism that it may lead to unnecessary paperwork and it will not be sufficient to trigger deep renovation. There is a need to integrate the iBRoad2EPC concept with the incentive programmes that offer a grant to renovate and/or replace a heating system.

Recommendations for adopting the iBRoad2EPC concept in incentive programmes in Poland

- Policymakers could consider modifying the 'Warm Flat' programme to include thermal upgrades in addition to the replacement of inefficient heating systems: the iBRoad2EPC concept could support this.
- Pilot projects are needed to build confidence in the iBRoad2EPC concept and demonstrate its ability to facilitate energy audits[36] and support loan applications.
- Using the iBRoad2EPC concept, policymakers should provide local governments and homeowners with user-friendly and precise guidelines on what they need to do to trigger thermomodernisation.
- Policymakers should inform people about ways in which the country can meet its 2050 decarbonisation targets, and provide further guidance about the iBRoad2EPC concept and the financial and non-financial incentive schemes.

Portugal

Opportunities to adopt the iBRoad2EPC concept and potential benefits

The current National Energy Conservation Plan (NECP) already includes a reference to BRPs and the concept of deep renovation. It was expected that an updated version of the EPC scheme and certificate with a BRP module (or similar provisions) would be in place by 2022, as outlined in the original NECP. However, this has not happened. At present, a revision to the NECP is expected in 2024 after the current proposal for the EPBD recast[37] has been approved. The EPC scheme update will be an action foreseen in this NECP revision. Moreover, the Portuguese LTRS lists the iBRoad project as one of the actions to stimulate and improve cost-effective deep renovations in buildings[38]. This presents an opportunity to integrate the iBRoad2EPC concept as an important instrument in national policies. For example, in a similar way to EPCs, BRPs could also be linked to OSS such as casA+ and to financing schemes. In general, policymakers have a low level of knowledge on the potential of integrating BRPs into EPCs (iBRoad2EPC) to monitor and evaluate the effectiveness of their financial incentive programmes. However, engagement with other relevant stakeholders including the National Advisory Committee (NAC) of the iBRoad2EPC project and with energy auditors during training (as a part of the iBRoad2EPC project) has demonstrated that there is a strong understanding of this approach among some stakeholders.

EPCs are an integral part of the major funding programmes, such as the Financial Instrument for Urban Rehabilitation and Renewal (IFRRU). Therefore, financial actors usually use them to meet the requirements of specific energy efficiency financing programmes. The iBRoad2EPC concept could be beneficial and act as a guide for future incentive schemes, as it could address some of the shortcomings in the current schemes. For example, with its strong emphasis on the energy efficiency first (EE1) principle, iBRoad2EPC could help enhance the current incentive schemes, with their strong focus on active measures, by also including passive design strategies.

Given the success of previous funding programmes that use the EPC as a tracking / eligibility / verification / monitoring tool, the same procedure can be used for iBRoad2EPC as a first step. Perhaps it would be advisable to make iBRoad2EPC a required tool for select funding programmes prior to establishing them as a means to access any financing scheme. The EPC is now recognised as a reliable and analogous support for these activities, and this may facilitate methods like iBRoad2EPC.

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[36] Energy audit can also include thermo-modernisation plans and their costs, on the basis of the energy audit there are calls for financial programmes.

[37] EUR-Lex - 52021PC0802 - EN - EUR-Lex (europa.eu)

[38] pt_2020_ltrs_0.pdf (europa.eu)

Recommendations for adopting the iBRoad2EPC concept in the incentive programmes in Portugal

- Policymakers could incorporate the iBRoad2EPC concept into public funding programmes, in a phased manner, alongside EPCs, which are already a successful tool for verifying and monitoring eligibility.
- iBRoad2EPC should be linked to OSS such as casA+, in order to enhance their functionalities in supporting funding schemes.
- Financial actors could make iBRoad2EPC a fundamental tool for asset valuation and link them to green mortgage programmes, taking advantage of the ongoing programmes and in line with the EU taxonomy.
- Policymakers could include iBRoad2EPC as part of the funding process, especially when a step-by-step approach is taken (e.g. 'Efficiency Voucher' and 'Support Programme for More Sustainable Buildings'), to ensure alignment with national strategies and avoid lock-ins that undermine further investments/funding. They are still relevant, but to a lesser extent, for one-time renovation programmes.

Romania

Opportunities to adopt the iBRoad2EPC approach and its potential benefits

The BRP is mentioned in the LTRS and its definition is included in the 'Energy Performance of Buildings Law L.372/2005', but a functional system has not yet been developed. It is expected that the DBL will be operational by December 2024, which could provide a framework for making iBRoad2EPC a voluntary option or to incorporate its features into the current EPC and energy audit methodology, including the iBRoad2EPC online assistant tool. In Romania, the definition of the iBRoad2EPC concept is more aligned with the energy audit than with the EPC. The energy audit procedures and report template can be modified to incorporate the iBRoad2EPC concept.

The real estate assets of entities may vary over time based on their efficiency levels. In this regard, the introduction of MEPS for existing buildings could play an important role in triggering renovations, as some assets do not meet the MEPS requirements, making them difficult to rent or sell. On the flip side, a client's evaluation of risk may be impacted by the current efficiency level of their residence, as renovation can result in a burden for much of the housing constructed prior to 2000. Nonetheless, banks can perceive the advantages of deep renovation – such as reduced energy costs, improved and healthier surroundings, and increased property value – as diminishing the risk of loan default, and may subsequently offer a lower interest rate.

Currently, the iBRoad2EPC concept is not widely known. Within the industry stakeholders are becoming aware of the necessity to renovate, however, there is still a lack of knowledge of the specifics of how and when. The initial recommendations need to be effectively communicated, outlining the benefits of the concept being phased in. In Romania, MEPS could succeed if the mandatory requirements are communicated in advance of their implementation and if adequate funding is provided to building owners, such as grants combined with subsidised banking products. Additionally, the process could be supported through the use of best practice examples and exemplary public buildings.

As BRPs are currently not developed and mandatory, they are not used by the financial sector, while EPCs are. However, access to an operational EPC database is required, and this is currently unavailable in Romania. The implementation of DBLs would facilitate the integration and use of BRPs in the future. Until a national framework for DBLs and BRPs is established, opportunities for the iBRoad2EPC concept will remain limited. Presently, there are no systems in place for step-by-step interventions. It is possible that the private non-residential market, which possesses extensive knowledge of energy consumption, may find a stepwise intervention system valuable. Most renovation projects are publicly funded, making the upfront investment for staged renovation accessible, which is consistent with the package of measures outlined in the energy audit report.

Recommendations for adopting the iBRoad2EPC concept in incentive programmes in Romania

- Policymakers could improve the performance target level, expand the range of eligible measures for funding, allow home owners' associations (HOAs) to participate, connect grants with loans, and communicate the advantages of the concept. iBRoad2EPC could be a useful tool to facilitate this.
- Policymakers should take measures to increase HOA involvement in the renovation decision-making process, such as in the selection of renovation measures and in determining the target energy performance level.
- Policymakers should make an on-site visit for EPC assessors or energy auditors mandatory for compliance with the iBRoad2EPC concept.
- Policymakers should link the grant amount to the target energy performance level and offer a partial upfront payment and/or link to alternative financing options, such as commercial loans.
- Policymakers should improve communication, and provide information and, where possible, technical assistance to the applicants.
- OSS should be established to facilitate the provision of comprehensive renovation services. The engagement of external experts to evaluate applications could be considered.
- Policymakers could use MEPS as a tool to trigger renovations, with ample communication of the mandatory requirements before they take effect, as well as the provision of well-funded options (e.g. grants combined with subsidised banking products) for owners.
- The implementation of best practices and showcasing of exemplary public buildings funded and renovated by using the iBRoad2EPC concept would also significantly aid the process.
- Banks and financial institutions could request BRPs as part of their financing programmes to increase market acceptance of the iBRoad2EPC concept.

Spain

Opportunities to adopt the iBRoad2EPC approach and its potential benefits

The LTRS 2020 incudes the potential of the BRP as an enabler of a staged renovation but also as a tool to be linked to the public grants when objective conditions for eligibility are set, like the EPC. At the moment, policymakers have not yet recognised the capacity of iBRoad2EPC to provide the information needed to assess the effectiveness of funding programmes. Until a national framework for DBLs and BRPs is established, opportunities for the iBRoad2EPC concept will be limited. However, as suggested by the NAC, iBRoad2EPC can potentially play a crucial role in the national implementation of the BRP, as it provides a common basis for further BRP developments, both public and private. Currently, there are no systems in place for step-by-step renovations. In the Basque Country, the Department of Territorial Planning and Urban Agenda is currently working on incorporating BRPs into the OPENGELA OSS model, although the process remains incomplete. Also in the Basque Country, Alokabide, the public company that manages the public rental housing stock, is working on a BRP as an instrument that allows to have a roadmap to decarbonise its stock (still to be completely defined and finished). It is possible that the private non-residential market, which has extensive knowledge of energy consumption, may find a stepwise intervention system valuable. The operational model promotes this strategic approach to renovation by defining the interlinkage between BRPs and the NBRP; however, digitalisation of public authorities is a barrier. The real estate assets of entities may vary over time based on their efficiency levels. In this regard, Minimum Energy Performance Standards (MEPS) play a crucial role because some assets fail to meet the market's renting or selling requirements. On the flip side, a client's evaluation of risk may be impacted by the efficiency level of their residence, as renovation can result in a burden for much of the housing constructed prior to 1980. Furthermore, random inspection of the effectiveness of incentive schemes has proven ineffective, primarily due to insufficient resources. To address this, the DBL could potentially represent a new paradigm, which will require industry readiness.

Recommendations for adopting the iBRoad2EPC concept in incentive programmes in Spain

- Policymakers should create a structure for additional public or private BRP schemes (under a framework analogous to the iBRoad2EPC concept) that could compete to produce these documents, benefiting both homeowners and professionals. This approach would enable a broader adoption of the iBRoad2EPC concept.
- Policymakers should legislate that each building should have a long-term renovation plan (by 2050, e.g. by using the iBRoad2EPC concept) to meet the country's decarbonisation targets.
- Training of the personnel involved in the energy renovation process (designers, architects, planners, project managers and other construction professionals) is crucial for the successful implementation of government support initiatives. To fill this gap, the iBRoad2EPC project has developed a kit of training material for construction professionals that can be incorporated in existing training programmes in the various pilot countries.[39]
- Financial institutions, which play a key role in stimulating new investments, should receive training on energy efficiency – including on the importance of information instruments such as iBRoad2EPC.

[39] iBRoad2EPC training material for construction professionals – Horizon 2020 iBRoad2EPC project

5. OTHER FACTORS IMPACTING INCENTIVE EFFECTIVENESS

At the heart of the analysis in this report are the various incentive programmes across the six partner countries that are listed in more detail in Annex 1. In Chapter 2, some of the most relevant incentive programmes per country were presented and the role of EPCs in the incentive programmes were assessed. However, given the lack of a direct causal relationship between EPCs and incentive effectiveness in triggering renovation, this chapter presents common emerging themes and contextual factors that are relevant across incentive programmes and shape their effectiveness - independently of EPCs. The value of this analysis is to complement recommendations made in Chapter 4 on the integration of the iBRoad2EPC concept allowing consideration of these contextual factors that might impede the effective implementation of the incentive. These common themes emerged in the country experts' analysis of the design and implementation features of each incentive programme:

- The effectiveness of incentive programmes in increasing renovation rates logically relates to the **scope of what renovation measures are supported**. The incentives relevant for iBRoad2EPC cover either existing SFBs, MFBs or public buildings.
- In addition to scope, the **extent to which renovation costs are covered** is a key factor in the success of financial incentive programmes.
- Well-designed incentive programmes may still fail if they are **inaccessible** to their intended target groups. This can occur due to complex socio-economic dynamics and the cultural context within which they are implemented. Across different partner countries, various accessibility criteria have been identified that are related to the success of the incentive programmes.
- As is shown in the various LTRS, the Covid-19 pandemic and the energy crisis have exacerbated energy poverty. Introducing incentive programmes to promote the renovation of buildings inhabited by **vulnerable groups** could significantly improve their quality of life, decrease energy expenses, and alleviate energy poverty. However, it is important to ensure that these incentive schemes are designed to be accessible, efficient and attractive.
- Finally, the **capacity of the public administration** as a limiting factor for the effectiveness of incentive programmes was addressed in two different ways, either in its role as an applicant itself (e.g. public buildings) or in its role of managing applications for a grant.

Some possible design features that impact the effectiveness of the incentive schemes identified in the six iBRoad2EPC pilot countries are highlighted in Table 2.

Table 2: Overview of factors impeding the effectiveness of countries' incentive schemes

Scope of incentives	
Poland	The 'Warm Flat' financial incentive programme is targeted at MFBs that are not connected to the district heat system (DHS) and aims to improve air quality, reduce dust and greenhouse gas (GHG) emissions by replacing heat sources and improving energy efficiency. However, under this scheme, house owners can only replace window and door frames and a boiler, and **cannot apply thermal insulation to the building envelope.**
Portugal	The 'Support Programme for More Sustainable Buildings' for owners of apartments/SFBs **incentivises active technological measures such as heat pump systems or PV systems (63% of eligible applications) more than passive design measures such as thermal insulation.**
Coverage of funding	
Bulgaria	Phase I of the 'Support for Sustainable Energy Renovation of the Residential Building Stock' programme covered 100% of the renovation costs. This created a high interest in participation (five to six times higher than expected). However, the high proportion of grants has created unrealistic expectations among citizens. **The 100% grant option hinders other financial support schemes for building renovation, as they cannot**

	compete. This may limit participation in future programmes and, in the long term, may restrict the amount of public funding available due to limited budgets. However, the problem caused by 100% coverage of cost goes even further in this case: these programmes discourage apartment owners in MFBs from actively participating in property maintenance. Instead, they transfer responsibility for organising, design and construction to the state or municipality. This results in a lack of control over the renovation process and quality, as owners merely decide to participate in the programme. Consequently, phase II of the programme only covers 80% of costs.
Greece	Experts from the Greek engineering community emphasised that the 'SAVING' scheme **should permit increased funding in justified circumstances**, despite having lower coverage percentages and caps of EUR 22,500 and 220 EUR/m^2 (40-75% coverage of costs). This reflects the current rise in market prices due to the energy crisis and the cost of materials and systems involved in a thorough and well-executed deep renovation, which country partners estimate typically exceeds the ceiling of €220/m^2.
Romania	The 'ESIF Regional Operational Programmes' and the funding under the National Recovery and Resilience Plan (NRRP) were deemed effective due to the **considerable grant amount (80-100% cost coverage).** However, country experts express concern that it **could foster a passive approach** (waiting for the 'for free' renovation that the neighbour received). They also fear that it could be used as a political instrument in particular during election years, leading to more renovations of lower quality – and thus a situation where renovated buildings will need to be renovated again when targets are raised in the forthcoming NBRP.
Accessibility	
Bulgaria	The 'Immovable Property Tax', despite being in place for more than a decade, is little known and is considered inaccessible and ineffective by country experts.
Poland	The 'Clean Air' programme targets low-income households and requires **beneficiaries to take a loan from the bank in addition to the subsidy**. Country experts state that despite the loan dissuading some people from participation, the programme is very successful because of its effective information campaign, its simple application and the support it receives from banks.
Portugal	The 'Efficiency Voucher' programme **utilises vouchers** that can be used with certified installers/suppliers who then claim the funds directly through an online platform. The initial requirement for individuals to use the online platform, obtain the voucher, select the intervention they wish to undertake, review market offers and contract the installer without technical assistance, created significant accessibility barriers. Under the latest updated version, a group of paid experts/facilitators are available to assist with the process. Users can directly approach one of these experts who will provide guidance, support, contact verified installers, obtain quotes, recommend appropriate measures, and advise on the entire process. Local energy agencies and municipalities also provide support for this process. Another lesson incorporated into the revised programme was that capping the value of vouchers at EUR 1,300 imposed restrictions on the types of interventions that could be carried out; for instance, replacing windows would be too costly. As a solution, the user can now receive up to three vouchers (3 x EUR 1,300) instead. For the implementation, however, a common issue found is the difficulty in obtaining funding, mainly due to the **lack of a specific dissemination strategy**, especially when the target households are rented or owned by families/individuals affected by energy poverty.
Romania	The 'Energy Efficient House Programme' administered by the Environmental Fund Administration (AFM) provides targeted groups with funds of up to EUR 15,000 and a maximum of 60% of the total investment costs for renovation works. However, the programme has faced significant limitations due to a **mandatory upfront payment**

	requirement from apartment owners and delayed reimbursements. From an initial 16,000 expressions of interest, only around 3,000 applications were completed.
Design for energy poverty and vulnerable groups	
Bulgaria	For the 'Support for Sustainable Energy Renovation of the Residential Building Stock - Phase II' programme, experts consider that there should be differentiated support schemes for different social groups as it does not particularly support energy-poor households. There is **no separate funding for energy-poor households** in general as, in fact, no official national definition of fuel poverty has yet been adopted in Bulgaria (a draft regulation has been prepared and is out for public consultation in October 2023). Currently, the only support in this respect is targeted at socially poor households, who receive heating subsidies – but nothing for energy improvements in their homes.
Greece	The 'SAVING' scheme is considered very accessible for building owners with low incomes because **the state provides a guarantee for the loans** and the loans are interest-free.
Poland	There is a concern that the 'Warm Flat' programme is **set at too low an income**, resulting in low accessibility for some of those who are still considered energy-poor. To qualify for a subsidy of more than 30% of the renovation costs, income per person must be less than PLN 1,894 per month (the minimum wage is PLN 2,800).
Romania	Barriers include upfront payment and/or delays in reimbursement. There is a new 'Energy Efficient House Programme', a **voucher system** incentive with a budget of EUR 267 million (via RePowerEU) managed by the Ministry of Investments and European Projects, with the contract set to be awarded by the end of 2024 (no evaluation available yet).
Spain	The 'partnership agreement with ICO' has had a large impact on individuals and households with few economic resources and difficulties in accessing financial support for renovation.
Capacity of public administration	
Bulgaria	One of the axes of the 'Regional Development Programme 2017-2027' is to extend assistance to increase administrative capacity at local and national level. However, in practice, **municipalities** are in charge of administering the procedure, yet **they receive no financial or technical support**.
Poland	A general observation from Poland is that there is a **need for user-friendly and detailed guidelines** for local governments and apartment owners on what to do to trigger thermomodernisation.
Romania	The previous 'Energy Efficient House Programme' for SFBs was an example of a financial incentive programme that was more effective than other programmes due to a better definition of requirements, less bureaucracy and a higher performance target. However, the **limited capacity of funding authorities** reduces the effectiveness of the scheme, for example due to inordinate delays in the evaluation of the applications and reimbursement. The 'Energy Efficiency in Public Buildings' programme for renovation of public buildings (100% coverage of costs) was well received, leading to a rapid depletion of funds as municipalities were able to easily apply and pay for the upfront investment costs.

Opportunities for iBRoad2EPC

iBRoad2EPC can play an important role in mitigating the unintended consequences of design and implementation features, and thus improve incentive effectiveness.

In regards to the **scope** of incentive programmes, in the context of a widespread implementation of iBRoad2EPC, countries could carry out a comparative analysis of aggregated data on the order of retrofit steps recommended. This would help to tailor incentive programmes to support most common first steps and provide further insight into the extent to which funding for active technology measures (e.g. solar PV) is actually needed to improve the energy performance of buildings.

Furthermore, iBRoad2EPC can be useful to determine the most effective percentage of **cost coverage**. If integrated with national (EPC) databases and the digital building logbook (DBL), anonymised aggregated data could allow for more targeted incentive programme design. This could be in the form, for example, of reserving 100% funding only for the most energy-efficient measure per building category, and – if data are available in the future – it could be differentiated for more vulnerable households. Furthermore, as it provides for increased reliability it can support the mobilisation of co-financing options.

A thorough evaluation of the incentive programmes aimed at improving **accessibility** is essential to increase the rate of renovation and to make full use of the improved EPCs. OSS are acknowledged by several partner countries as a channel to raise awareness of the benefits of renovation and of funding options. iBRoad2EPC can act as a tool not only to enhance the monitoring of renovation rates but also to increase the knowledge of the advantages of renovation among target populations.

Furthermore, iBRoad2EPC can contribute to making an intervention more robust due to providing a better-quality assessment which can inform decision making of financial actors for preferential private financing. This is particularly important for more **vulnerable groups** which are less able to pay upfront. However, it is key for the advancement of iBRoad2EPC to consider the higher costs for the EPC when enhanced with a BRP (due to a mandatory site visit) and design incentive programmes in such a way that these costs can be covered.

While an improved EPC will not solve **problems of capacity in public authorities**, it provides a way to improve countries' renovation rates and shines a new light on the weaknesses in the system that need to be addressed. iBRoad2EPC can be a glue that links measurable policies (including in the new version of the LTRS) and tailored funding streams to house owners and public authorities. It can also increase the usefulness of OSS and other awareness-raising measures. In a forthcoming iBRoad2EPC report – providing an advisory package for public authorities – the project aims to address the capacity issues of implementing authorities, particularly municipalities.

6. CONCLUSIONS AND RECOMMENDATIONS

The added value of the iBRoad2EPC concept is that it can significantly enhance the quality of EPCs and the effectiveness and acceleration of deep renovation interventions. Financial and non-financial incentives play a key role in facilitating these deep renovations, which are associated with high costs – and therefore offer an entry point for the iBRoad2EPC concept. The integration of iBRoad2EPC - with BRP-enhanced EPCs - into these financial and non-financial incentive programmes could improve their effectiveness by (1) prescribing clearer guidelines for public administrations on what renovation interventions should be incentivised with priority; (2) tying the exact amount of funds to specific and measurable energy improvements; and (3) providing building owners with clear, reliable and actionable information, thus making renovations more accessible.

EPCs can play a key role in assessing the impact of a given renovation measure, while also supporting the quantification of the energy performance of the national building stock. Previous analysis (e.g. *Conceptualising iBRoad2EPC: can EPCs be upgraded to include Building Renovation Passport elements?* and *iBRoad2EPC initial national guides*) have addressed issues related to the quality of EPCs in the six partner countries and the possibility of improving them by integrating the iBRoad2EPC concept, also considering that EPCs do not use measured data but calculated data based on certain standards. While the quality of EPCs is directly related to their contribution to absolute energy savings and the measurement of renovation progress, the way they are built into the design and requirements of incentive programmes plays a crucial role.

In some countries – e.g. in Bulgaria, Greece, Poland and Spain, – EPCs are mentioned as the main tool to certify achieved energy savings after renovations. In **Greece**, the 'SAVING' programme for residential property owners uses EPCs in the initial application and later for the certification of the project. They are used to prioritise the worst-performing buildings during the application process, and to confirm that buildings have achieved significant energy savings. The incentives are reported to have been very successful with building owners, with the last two versions of the scheme being more strictly controlled. However, in **Bulgaria** it is reported that the audits/EPCs, while theoretically being used to prove energy savings, do not lead to higher renovation rates: given the high coverage of funding owners lack incentives to pay for the cost of the EPC, leading to a situation where their use is not properly enforced. In **Romania**, the EPC is a critical document for assessing and reporting the impact of renovation. An EPC is required for the pre-renovation state of the building (together with the energy audit report), and a new EPC is required for the renovated building (after all the work has been completed) together with an implementation report (describing how the impact indicators have been met). The impact of the refurbishment is assessed on the basis of the difference in final and primary energy, CO_2 emissions and renewable energy (and other KPIs) between the initial EPC and the final EPC. However, a lack of understanding of energy consumption and potential savings is mentioned in the Romanian LTRS as one of the main barriers, stemming from the lack of a national building register. Thus, data gaps – despite the requirement for an ex-ante and ex-post EPC assessment – inhibit actual energy savings. In **Portugal**, the EPC is used to evaluate the success of the incentive programme itself. For many schemes, it is too early to draw conclusions on their success or failure, or statistical data are lacking. Poor EPC quality can also impede quantification of energy savings.

Overall, it appears that despite the role of EPCs in the design of incentives to monitor energy savings, no causal link can be established between the use of EPCs and the achievement of actual energy savings. The quality of EPCs plays a crucial role for both the acceptance and the quantification of savings, which offers a significant opportunity for iBRoad2EPC to make a difference by guaranteeing higher EPC quality. Reliable EPC results are essential if incentives or obligations are based on EPCs. The following observations can be made about the relevance of EPCs.

Key takeaways on the use of EPCs in incentive programmes

- EPCs are required before and after the renovation for most incentive schemes.
- EPCs are sometimes used to identify and prioritise the worst-performing buildings.
- EPCs are used as a tool to monitor the effectiveness of the renovation at the building level and at the level of the incentive scheme.
- There is little confidence in the quality and the use of EPCs across partner countries.
- Even within a country, the use of EPCs is not consistent or standardised across the building types and incentive schemes.
- EPCs are used by certain commercial banks as tools to verify energy savings and meet the requirements of financial instruments.

The vision of iBRoad2EPC is to integrate BRPs into EPCs in order to improve the latter's quality, increase understanding of renovations for building owners, and accelerate overall deep renovation rates. With the expected renewal of the LTRS under the revised EPBD in the coming year (in the form of a NBRP), there is a great window of opportunity to integrate the iBRoad2EPC concept into the design of incentive programmes. A stronger role for EPCs makes sense not only to improve their quality and facilitate funding, but also to evaluate the incentive programme themselves. Improving EPC quality through incorporating BRPs (as in the case of iBRoad2EPC) has vast potential to enhance effectiveness.

The insights from different incentive programmes in the six partner countries provide for a set of specific recommendations or best practices that policymakers and other actors can consider for integrating the iBRoad2EPC concept in incentive schemes in the coming years.

Overarching windows of opportunity and recommendations for adopting the iBRoad2EPC concept

- **Building owners** can benefit from reduced energy audit costs and added value (stepwise refurbishment plan) by using the iBRoad2EPC concept.
- **Banks** could use iBRoad2EPC (along with other relevant documents) to decide whether to finance building renovation measures. They could request iBRoad2EPC as part of their financing programmes. The iBRoad2EPC concept should give banks confidence to disburse loans for renovation, especially if this approach is not currently included in the national legislation.
- **Financial actors** could use iBRoad2EPC as a fundamental tool for asset valuation and link them to green mortgage programmes, taking advantage of the ongoing programmes and in line with the EU taxonomy. For this to work, financial institutions, which play a key role in stimulating new investments, should receive training on energy efficiency – including on the importance of information instruments, such as the iBRoad2EPC.
- **Policymakers** should consider MEPS for buildings (as part of the EPBD) to create the conditions for a step-by-step renovation, such as those provided in the iBRoad2EPC.
- **Policymakers** should design financial incentives with lower grant percentages and find ways to accessibly increase private funding to create the conditions for step-by-step renovation (e.g. by using iBRoad2EPC) and to achieve a high renovation rate, for cases where financing one-time deep renovation is a challenge.
- **Policymakers** should present different instruments (e.g. EPCs, iBRoad2EPC and BPPs) to each stakeholder group, explaining their scope and benefits, giving examples of such activities in the context of any existing programmes. This provides a first step towards integrating the iBRoad2EPC concept into incentive schemes. In countries where BRPs are already mentioned in the LTRS, the iBRoad2EPC concept could provide a framework to widen their scope and uptake.

- **Policymakers** should develop a framework through which EPC/BRP initiatives (such as iBRoad2EPC) can compete for the production of these documents on the basis of their added value compared to other technical proposals, to the benefit of both homeowners and professionals.
- **Policymakers** should increase awareness about various ways in which to meet their country's 2050 decarbonisation targets, and provide further guidance about the iBRoad2EPC concept and the financial and non-financial incentive schemes.
- **Policymakers** could incorporate the iBRoad2EPC concept (and BRPs) into public funding programmes, in a phased manner, alongside EPCs – which are already a successful tool for verifying and monitoring eligibility. Furthermore, they could include iBRoad2EPC as part of the funding process, especially when a step-by-step approach is taken to ensure alignment with national strategies and to avoid lock-in effects that undermine further investments/funding.
- **Policymakers** could couple the amount of funding to the realised renovation steps: either higher funding for the first step to incentivise an early start of renovation and highest possible savings in the first step; or increasing the incentives with the implemented steps from the iBRoad2EPC as reward for following the renovation plan.

Outlook

Going forward it is key that policymakers working on updates around national renovation strategies (expected in the form of the NBRP under the recast EPBD) pay particular attention to various contextual factors that impact the effectiveness of incentive programmes. Their design, implementation, interplay and mutual enforcement, accessibility, scope and the capacity of implementing authorities can all affect the proportion of money spent and the actual energy savings achieved.

In regards to the scope of programmes – for example, when an incentive programme targets a switch to a cleaner energy source and improvements in the energy efficiency of buildings – the allocation of funds may appear be biased towards the promotion of building-integrated renewable energy systems (e.g. in the case of Portugal). This may discourage the widespread uptake of energy efficiency renovations in buildings, such as the addition of thermal insulation. Incentive schemes should be developed in a coordinated way, also contributing to national renewable energy targets, as discussed in Chapter 3 on LTRS. However, the bias identified here could be addressed by linking the available budget to energy efficiency or renewable energy measures through different programmes, or through requirements that respect the EE1 principle that gives priority to renovation measures. The iBRoad2EPC concept goes beyond the scope of these incentive programmes, as it systematically treats the building as a whole and aims to combine efficiency and renewable energy for optimal impact.

Another consideration in better aligning future versions of the LTRS with incentive programmes that go beyond the quality of EPCs is that although the increased coverage initially offered some advantages in securing funding and submitting applications, it was widely acknowledged that this approach was unsuitable for the sustained funding needed to renovate entire building stocks at the scale required in each country. Chapter 3 highlighted that although many LTRSs give priority to mobilising co-financing options to lessen the need to cover costs at a rate of 80-100%, this is still a practical challenge in all partner nations. As a result, it may be a barrier to household participation, as is seen in the case of Poland.

Furthermore, key design features for accessibility are to avoid the need for upfront payment and implement differentiated incentive programmes for vulnerable populations (e.g. the voucher systems in place in Romania and Portugal).

ANNEX 1 – OVERVIEW OF INCENTIVE PROGRAMMES PER COUNTRY

Annex 1 provides an in-depth overview of the financial and non-financial incentive programmes from the six partner countries. Each of the country partners within the iBRoad2EPC consortium was provided with the same table. While the number and nature of incentive programmes varies across countries, the following dimensions were investigated per programme: target group, eligibility criteria, budget, effectiveness in triggering renovation, assessment of design, and implementation. For some programmes certain categories are left out if no information was available. Some of the programmes were too new to be assessed.

It needs to be noted that financial incentive programmes in particular have limited opening times and are thus quickly outdated.

Bulgaria

Programme 1

Title	ПОДКРЕПА ЗА УСТОЙЧИВО ЕНЕРГИЙНО ОБНОВЯВАНЕ НА ЖИЛИЩНИЯ СГРАДЕН ФОНД
Title (English)	Support for Sustainable Energy Renovation of the Residential Building Stock – Phase II
Type	Financial incentive
Target group	Owners in multi-family apartment buildings in cities
Eligibility requirements	All multi-family residential buildings in the state that are managed under the Condominium Management Act and were designed before 26 April 1999 are eligible for funding. Municipalities can apply in partnership with the home owners' associations (HOAs) registered under the same law. The funding is available for implementing mandatory energy efficiency improvements prescribed in the energy audit. After implementing energy saving measures (ESMs), buildings ought to attain at least energy class B while realising a minimum of 30% primary energy savings.
Budget	Total budget is BGN 282,470,400 (equates to around EUR 144,594,359) with VAT. 80% of the funding is available from the public grant and 20% co-financing is required. Phase I of the renovation programme has been executed with 100% grant subsidy.
Effectiveness in triggering renovation and achieving energy savings	There is a significant interest in participating in the programme, exceeding initial expectations by a factor of five or six. Nonetheless, it remains unclear how the programme will proceed to address the renovation requirements for eligible buildings not approved during this phase.
Assessment of design including accessibility	Single-family apartment buildings are not eligible, although they are covered in another programme (see programme 2 below). No financial instruments to support the participation of energy-poor households are in place. The high percentage of grants creates unrealistic expectations in citizens and could potentially lead to lower participation in future programmes, which will inevitably have lower public funding. Therefore, such a model is not sustainable. There should be a lower grant percentage to attract more private funding and achieve a higher building renovation rate. There should be differentiated support schemes for different social groups (energy-poor etc.)
Assessment of implementation	Insufficient information campaigns exist for financial instruments requiring co-financing. While municipalities are responsible for administering the process, they do not receive financial or technical assistance due to their limited capacity. Therefore, improved communication strategies are required to guarantee widespread participation, and local authorities should receive both financial and technical assistance.

Programme 2

Title	Програма "Развитие на регионите" 2021-2027
Title (English)	Regional Development Programme 2021-2027

Type	Financial incentive
Target group	Building owners in multi-family apartment buildings and single-family households
Eligibility requirements	Funding will be based on the territorial strategies developed under the responsibility of the territorial authorities (10 municipal administrations) and the 6 integrated territorial development strategies for level 2. Planning regions focusing on the 40 municipalities have been developed under the responsibility of the Regional Development Council in the NUTS 2 region concerned, which will perform functions related to the pre-selection of project ideas.
Budget	For financial instruments the budget is EUR 236.2 million, including loans and grants.
Effectiveness in triggering renovation and achieving energy savings	On the basis of the first published document, it is expected that there will be similar weaknesses in the design and implementation of the programme as in Programme 1. This is because there will be higher grant percentages, which will not really provide strong incentives to increase the rate of renovation in the country. Renovation will be limited to the given budget.
Assessment of design including accessibility	Larger regions are a priority, but the requirements have not yet been finalised.

Programme 3

Title (English)	Immovable Property Tax
Title	Данък върху недвижимите имоти
Type	Fiscal incentive
Target group	Building owners
Effectiveness in triggering renovation and achieving energy savings	Buildings commissioned before January 2025 with an energy class of B and buildings commissioned before January 1990 with an energy class of C are exempt from property tax. This will encourage renovation of low energy class buildings to a higher energy class.
Assessment of design including accessibility	This scheme supports renovation to low energy class C. For energy classes A and B there is an equal tax relief. Additional incentives should be provided for buildings aiming to achieve energy class A and near-zero energy (buildings), in combination with other financial instruments.
Assessment of implementation	In the absence of a strong communication campaign at national and local level, few people have heard about the tax incentives. The effect of tax exemptions to stimulate renovation is minimal in small settlements with low tax rates. A better communication campaign is needed, as the measure has had limited or no impact for more than 15 years since its implementation.

Greece

Programme 1

Title	Εξοικονομώ 2023
Title (English)	SAVING programme (latest version SAVING 2023)
Type	Financial incentive
Target group	Owners of residential properties (either apartments or single family/multi-family buildings)
Key stakeholders	Banks, the Ministry of Environment and Energy, construction professionals, energy auditors (known as ‘energy inspectors’ in Greece)

Eligibility requirements	Own a residential property that is legal (according to a building permit) or legalised, that has an EPC class of 'Γ'[40] or lower, and that is used as a main residence. Only one application per person is permitted. The property must be upgraded by at least three energy classes according to the EPC obtained after renovation. The funding is also subject to three conditions: 1) the total cost cannot exceed EUR 22,500, 2) the ratio of euros/kWh saved should not exceed 1:10, and 3) the budget should not exceed 220 EUR/m^2 of the property.
Budget	The total budget for the 2023 cycle is EUR 300 million. It includes public funding of between 40% and 75% of the cost of energy improvements, depending on the income of the beneficiary and whether the property is owner-occupied or rented.
Effectiveness in triggering renovation and achieving energy savings	The scheme has been very successful with building owners. The last two iterations of the scheme have been more rigorous, and energy savings have definitely been achieved in registered properties.
Assessment of design including accessibility	In some cases, the cost per kWh saved and the restrictions on the total cost may limit the effectiveness of the programme in large houses and/or in houses located in remote areas of the country. The scheme works well as a stimulus for renovation because low-income owners and older/inefficient buildings are given priority, and they also receive more public funding. In general, an amount higher than EUR 22,500 and 220 EUR/m^2 should be justified in some cases.
Assessment of implementation	Remuneration for energy experts used to be very low. In the latest version, the amounts have been increased, but they are still lower than they should be. This means that engineers don't really want to be involved in the scheme, which leads to poor quality work and long delays in completing projects. There are also long delays between the initial application and the actual approval of the renovation work to be carried out. Energy experts should be paid more for issuing the necessary permits and managing the applications.

Programme 2

Title	Εξοικονομώ - ανακαινίζω το σπίτι μου - για νέους
Title (English)	SAVE-RENOVATE scheme for young persons
Type	Financial scheme
Target group	Owners of residential property (either apartments or single-family houses) born between 01/01/1984 and 31/12/2005 are eligible for this scheme. It is unclear whether the scheme has successfully reached the target group, as it was only launched in May 2023.
Key stakeholders	Banks, the Ministry of Environment and Energy, construction professionals, energy auditors (known as 'energy inspectors' in Greece)
Eligibility requirements	Ownership of a residential property that is legal (with a building permit) or has been legalised, has an EPC class of 'Γ' or lower and is used as a principal residence is a prerequisite for participation in the programme. In particular, the RENOVATE part of the programme has additional restrictions: the income of the beneficiary (person or family) must be less than EUR 20,000, the value of their property must not exceed EUR 300,000, they must live in the building to be renovated, and they must be the main owner. Larger families (with more than three children) also receive more funding (+15% for the SAVE part, which is for energy-saving measures). Only one application per person is allowed. The property must be upgraded by at least three energy classes according to the EPC obtained after renovation. The funding is also subject to 3 conditions: 1) the total cost cannot exceed EUR 22,500, 2) the ratio of euros/kWh saved should not exceed 1:10, and 3) the budget should not exceed 220 EUR/m^2 of the property.

[40] $1{,}00R_R < EP < 1{,}41R_R$, Greece uses an energy rating of the building on a scale of A to H. The letters will be: A+, A, B+, B, Γ, Δ, E, Z, H with A+ being the highest possible rating.

Budget	The total budget of the scheme is EUR 300 million and the target is to finance the renovation of 105,000 homes by 2025. The percentage of public funding ranges between 40-85% for the energy saving (SAVE) part, and is 30% for the general renovation (RENOVATE) part.
Effectiveness in triggering renovation and achieving energy savings	There is no statistical data yet available. However, there are strong incentives to achieve high energy savings.
Assessment of design including accessibility	Illegal buildings require legalisation for enrolment, and this can often be a problem. The mixed ownership status of some properties can also be a barrier. As this is a new scheme compared to the long-running SAVING scheme, the funding can be considered very accessible for low-income owners, as the loan is guaranteed by the state and the loans are interest-free for all applicants. For the SAVE part, a higher amount than EUR 22,500 and 220 EUR/m^2 may be justified in some cases.
Assessment of implementation	Remuneration for energy experts used to be very low - please see the assessment of implementation in Programme 1.

Programme 3

Title	ΗΛΕΚΤΡΑ
Title (English)	ELECTRA
Type	Financial incentive
Target group	Public authorities that use buildings in the following categories: healthcare, education, offices and other types of public buildings such as cultural, athletic facilities, museums, buildings used by religious authorities etc. The success of the scheme cannot yet be determined as the programme was launched in September 2022 and is still open for applications.
Key stakeholders	Public authorities as beneficiaries, the Ministry of Environment and Energy, CRES (Centre for Renewable Energy Sources and Saving), energy inspectors and energy auditors (the first are EPC issuers), construction professionals, engineers
Eligibility requirements	Buildings that are to be upgraded must have a useful area of more than 500 m^2 (300 m^2 for areas with a lower population, former lignite producing regions, or areas that suffered forest fires during 2021). They must have an EPC class of 'Γ' or lower. They must achieve at least a 30% reduction in primary energy use after the works and they must not exceed a cost of 1.50 EUR/kWh saved. Finally, they must undergo seismic inspection prior to the application.
Budget	The total budget for this cycle, expected to close at the end of 2025, is EUR 640 million. Public funding is provided in the form of a grant ranging between 50-95% of the eligible energy upgrade costs (the higher percentage is foreseen for buildings that achieve greater savings).
Effectiveness in triggering renovation and achieving energy savings	There is no statistical data to determine this, but for the buildings that are enrolled the incentives for achieving large energy savings are strong.
Assessment of design including accessibility	Accessibility: there are bureaucratic procedures that characterise public administration authorities in general, and then the buildings must be built according to a building permit or legalised. Some smaller authorities may lack the capacity to follow the procedures in the regulations regarding public tenders and works. The barriers are the bureaucratic nature of public procedures and tenders and the illegal nature of many buildings, even if they are used or owned by public services. However, by offering generous incentives for deep renovation, the programme should be successful in achieving substantial results in the end.
Assessment of implementation	We have no prior experience and statistical data is not yet available: see above.

Poland

Programme 1

Title	Czyste powietrze
Title (English)	Clean Air programme
Description	The goal of the programme is to improve air quality and reduce greenhouse gas emissions by replacing heat sources and improving the energy efficiency of single-family residential buildings.
Type	Financial incentive
Target group	The programme is for people on relatively low incomes.
Eligibility requirements	The beneficiary is a the owner/co-owner of a single-family residential building or a separate residential unit in a single-family building with a separate land and mortgage book.[41]
Budget	PLN 83,300,000,000 (equates to around EUR 19,192,320,000) and PLN 20,000,000,000 as loans
Effectiveness in triggering renovation and achieving energy savings	The programme has been very successful: so far 633,536 applications have been submitted, and the programme has caused provinces to start implementing anti-smog resolutions. The programme is supported by banks and the provincial environmental protection fund.
Assessment of design including accessibility	Accessibility: the programme is aimed at people with a fairly low income, but part of the subsidy is a loan from the bank, which makes many people choose not to participate. The principle of the programme is simple: you perform a thermal modernisation measure and/or heat source replacement, then upon completion you perform an energy audit and create a claim for reimbursement.
Assessment of implementation	The programme is clearly written and advertised on many levels (on the internet, in the media, in offices), filling out the application is quite simple, and it is done after the thermal modernisation and audit, so experts often suggest taking part in the programme. No changes should be made, although the programme could also be adapted for multi-family housing.

Programme 2

Title	Ciepłe mieszkanie
Title (English)	Warm Flat programme
Description	The goal of the programme is to improve air quality and reduce dust and greenhouse gas emissions by replacing heat sources and improving energy efficiency in dwellings located in multi-family residential buildings.
Type	Financial incentive
Target group	The final beneficiary is an individual holding a legal title arising from ownership or limited right to a residential premises, located in a multi-family residential building.
Eligibility requirements	An annual income not exceeding PLN 120,000 (for the lowest incentive), and ownership of premises in a multi-family residential building. A condition of the subsidy is that the final beneficiary undertakes that after completion of the project there will not be installed any heat sources for solid fuels with a class lower than 5 according to European standard EN 303-5.

[41] Ownership of the real property, as well as other rights to property and encumbrances (such as mortgages) are registered in the land and mortgage book. A mortgage must be registered to become effective.

Budget	PLN 1,400,000,000
Effectiveness in triggering renovation and achieving energy savings	The programme has been reasonably successful. One factor is that there are fewer houses eligible as multi-family houses in Poland especially not fed by district heating networks are less common.
Assessment of design including accessibility	Accessibility: low – to qualify for more than 30% of the heat source price you need to have a very low income (at the level of PLN 1,673 = EUR 375), and the building cannot be connected to the district heating network (as is the case for most multi-family houses) The programme is well designed, the only problem is that its target group is communicated no clearly and thus it sounds like it is aimed at apartment owners, and it should be more for apartment communities.
Assessment of implementation	The programme is successful in removing old heat sources but does not result in thermal upgrades. It should be changed from replacing only heat sources to replacing heat sources and thermal upgrades.

Portugal

Programme 1

Title	Programa de Apoio a Edifícios mais Sustentáveis
Title (English)	Support Programme for More Sustainable Buildings
Type	Financial incentive
Target group	Owners of residential buildings (single family/apartments). Outreach is very successful - given the conditions set out below there was consumer and media interest in the programme.
Eligibility requirements	Eligible measures include efficient windows, insulation, renewable heating and cooling equipment, PV systems, water efficiency and bioclimate architecture. General eligibility criteria include the improvement of the energy performance of the housing unit, the need to use registered suppliers in several of the official platforms and specific criteria dependent on each measure. For instance, efficient windows need to have at least A+ energy class according to the national Classe+ labelling scheme. The new call creates new additional funding rates for applicants outside the two main districts in Portugal (Porto and Lisboa).
Budget	There were several stages: the first one was EUR 30 million. Given the success of the programme it was raised to EUR 75 million, then EUR 96 million, and finally EUR 135 million. Reimbursement is 100% from public funding, at a rate of approximately 85% dependent on the measures. The new call has an overall budget of EUR 30 million.
Effectiveness in triggering renovation and achieving energy savings	A total of EUR 189.6 million was invested by applicants, with EUR 122 million reimbursed by the programme. It is estimated that the measures introduced can potentially achieve an annual energy cost savings of EUR 38 million. Still, a major part of the funding was directed to PV systems and other active measures, which leaves less funds for renovation and operational energy savings preferable under the EE1 principle.
Assessment of design including accessibility	Accessibility: funding is based on a reimbursement procedure which implies that all costs are paid upfront and reimbursed if the application is eligible and the overall budget is not spent. Only those capable of making their own investment with a slight risk and who are able to navigate the electronic application procedure can apply. The high funding rate (85% for most measures), the fact that the monitoring/inspection is based mainly on invoices and pictures before and after the project, and the pre-existence of other verification schemes (verified contractors and labelling systems) are enablers of the system. Having to make the total investment up front and receiving reimbursement later leaves some potential beneficiaries behind. There should be more focus on passive energy efficiency measures (which were not as successful as, for instance heat pumps and PV systems): the incentive for active measures should be reduced

	strongly or removed to ensure the EE1 principle is applied, and other possibilities for rented houses – such as the tenant being able to apply – should be included.
Assessment of implementation	As mentioned previously, a majority of applications related to active measures (heat pumps and PV systems – 63% of eligible applications). This could potentially undermine the EE1 principle and leave behind the most difficult but important measures such as insulation. Given the success of the programme there were some delays in the evaluation of the applications, which caused concern for the applicants. The support structure should be strong and flexible enough to cope with the high level of applications.

Programme 2

Title	Vale Eficiência
Title (English)	Energy efficiency coupon
Type	Financial incentive
Target group	Families potentially affected by energy poverty, or owners of the house where they reside - outreach has been low given the specifics of the target group and the lack of a dedicated dissemination strategy.
Eligibility requirements	Owners and residents in the residential building who are beneficiaries of the social electrical energy tariff. The voucher is delivered and then can be used with certified installers/suppliers who claim the money directly on the platform.
Budget	EUR 32 million overall budget for an estimated 20,000 coupons (EUR 1,300 each). 100% public funding. Phase 2 – EUR 103 million overall budget for an estimated 80,000 coupons (EUR 1,300 each, maximum of three coupons for each beneficiary). 100% public funding.
Effectiveness in triggering renovation and achieving energy savings	Even if some applications are still being evaluated, the total number of coupons has been roughly 50% of the intended target, which reveals the programme is underperforming. There has still not been an evaluation of energy savings, but it is probable that there is a focus on windows and active measures (similar to the More Sustainable Buildings programme, as they have the same types of eligible measures).
Assessment of design including accessibility	Accessibility: access to the funding is via an online platform, which is difficult for some of the target audience. Also, this specific target audience is less likely to have access to information on funding and similar topics. The voucher has a value of EUR 1,300, so it only covers a small part of the investment needed for interventions such as full window replacement or insulation. Also, the fact that active measures are allowed with the same funding rate means the programme is skewed towards these options. In addition, there is no limit on the budget per intervention – this can potentially lead to higher prices if the supplier knows they will get a guaranteed refund. More than one voucher per person/house should be allowed, depending on the investment/measure in the application. Support for the application procedure should be reinforced. Funding rates should be differentiated, with more focus on passive measures.
Assessment of implementation	There is no strategy or resources in place for supporting applicants on the ground, for instance through local associations and authorities. Extra resources are needed to allow dedicated support for communities. A wide dissemination campaign should be provided for the media. Partnerships with local authorities and associations should be created, with dedicated funding for their support.

Programme 3

Title	Apoio à Renovação e Aumento do Desempenho Energético dos Edifícios de Serviços
Title (English)	Support to Renovation and Energy Performance of Services Buildings (applications closed but new calls expected very soon)

Type	Financial incentive
Target group	Owners of non-residential buildings - private sector
Eligibility requirements	Buildings must be under a mandatory EPC evaluation according to national legislation (with the exception of expansion works, which are not eligible). There should be at least 30% primary energy reduction, water efficiency systems at least class A, windows at least class A, there are registered suppliers in several of the official platforms, and specific criteria dependent on each measure. Measures must include windows, technical systems, or renewable energy production for self-consumption, and they can also include water efficiency and energy audits.
Budget	EUR 20 million total budget, with a maximum of EUR 200,000 per application (100% public funding of reimbursement, with a funding rate of approximately 70%)
Effectiveness in triggering renovation and achieving energy savings	N/A
Assessment of design including accessibility	Still to be evaluated: no results yet available.
Assessment of implementation	Nothing relevant to report

Programme 4

Title	Eficiência Energética em Edifícios da Administração Pública Central
Title (English)	Energy Efficiency in Central Public Administration Buildings (applications closed but new calls expected very soon)
Type	Financial incentive
Target group	Central public administration buildings
Eligibility requirements	Applicants must have an efficiency plan approved according to the ECO.AP 2030 programme (national energy efficiency in public administration). It must achieve at least 30% primary energy reduction, water efficiency systems at least class A, windows at least class A. There are registered suppliers in several of the official platforms, and specific criteria dependent on each measure. Measures must include windows, technical systems, or renewable energy production for self-consumption (maximum 15% of the primary energy reduction), and can include water efficiency and energy audits. An EPC is mandatory.
Budget	EUR 40 million total budget, maximum EUR 5 million per application (100% public funding of reimbursement, at a funding rate of 100% for eligible expenses)
Effectiveness in triggering renovation and achieving energy savings	Still to be evaluated: no results yet available.
Assessment of design including accessibility	The application is relatively complex but the main barrier is the need to have a very detailed intervention plan and to achieve a 30% reduction in primary energy. The size of interventions in comparison to the total budget makes it very difficult to obtain financing.
Assessment of implementation	Nothing relevant to report

Programme 5

Title	Programa de Apoio a Condomínios Residenciais
Title (English)	Support Programme for Multi-family Buildings
Type	Financial incentive

Target group	Owners of multi-family buildings and condominiums
Eligibility requirements	Applications must have support from a qualified expert under the national EPC scheme or other certified technician, the contractor must be registered under existing national platforms such as casA+ and Casa Eficiente 2020. Eligible measures are only for the building envelope insulation. Applications can only be made for interventions that have not started, and the budget and detailed planning must be provided. Buildings must be mainly for residential purposes. Applicants must prove they have sufficient communal financial resources for the non-funded part of the intervention.
Budget	EUR 12 million total budget, maximum EUR 150,000 per application (100% public funding of reimbursement, at a funding rate of 70% for traditional solutions and 80% using eco-materials)
Effectiveness in triggering renovation and achieving energy savings	Still to be evaluated: no results are yet available.
Assessment of design including accessibility	Accessibility: the application is relatively complex but the main barrier is the need to have a communal fund already available as proof of financial capacity for the non-funded part of the intervention. This links to the difficulty in making investments in most of the condominiums, as they need agreement and participation from most owners. The design focus on passive measures allows for implementation only after approval (fixing some of the issues from the previous programmes), but does not address the main barrier of getting agreement between the different owners. A dedicated strategy – and possibly funding – for this subject should be established.
Assessment of implementation	This is discussed in the previous points. Even if it is not strictly a design issue, the programme should provide ways to overcome the main barrier: difficulty in agreement between owners. Extra resources should be added to allow dedicated support for the owners, with a strategy on how to overcome the main barriers. A wide dissemination campaign should be provided for the media. Partnerships with local authorities and associations should be created, with dedicated funding for their support.

Programme 6

Title	Instrumento Financeiro para a Reabilitação e Revitalização Urbanas
Title (English)	IFFRU - Financial instruments for urban rehabilitation and revitalisation
Type	Financial
Target group	Owners of whole buildings including social housing, buildings more than 30 years old, and industrial buildings
Eligibility requirements	Full renovation of buildings. Support from the municipality. No works have started. Proof of financial conditions to carry the operation. Proof of licensing procedures.
Budget	EUR 107 million of national funds (ESIF + national public contribution) + EUR 580 million (EIB/CEB). Private funding from financial institutions must be at least equal to public funding (~EUR 700 million), and the promoter should have approximately of 30% of their own financing (EUR 600 million). There is a total investment of EUR 2 billion.
Effectiveness in triggering renovation and achieving energy savings	Very effective. The system has been created from scratch to link urban renewal policies with energy efficiency. As detailed below, EPCs before and after are mandatory for all interventions. There is a mandatory upgrade of at least two energy classes.
Assessment of design including accessibility	Financing is based on a low-interest loan scheme and guarantees through commercial banks, with the support and cooperation of national bodies such as ADENE and the municipalities (ANMP), the Portuguese Directorate General for Energy and Geology (DGEG), the Directorate General for Treasury and Finance (DGTF), the Portuguese Institute for Housing and Urban Regeneration (IHRU) and the Portuguese Institute for Tourism (Turismo de Portugal). Funding that allows lower interest

	rates comes from the European Structural and Investment Funds, the European Investment Bank (EIB), the Council of Europe Development Bank (CEB) and the national budget (national public contribution). The system has strong support from financial institutions and public authorities. There are no issues to report regarding the scope of the intervention. Similar programmes could also be developed for smaller-scale renovations.
Assessment of implementation	The scheme has strong support from financial institutions and public authorities. Since 2017, a total of EUR 1.428 million has been agreed, which corresponds to 220 fully renovated energy-efficient residential buildings and ~230 non-residential buildings. With all stakeholders on board, the close partnership with municipalities contributes to the success. This programme is not accessible to smaller scale interventions due to the complexity of the interventions and investments required.

Programme 7

Title	Áreas de Reabilitação Urbana
Title (English)	Urban Regeneration Areas
Type	Non-financial incentive
Target group	Owners of buildings situated in areas where buildings, infrastructure and urban space reveal signs of degradation
Effectiveness in triggering renovation and achieving energy savings	The Urban Regeneration Areas procedures are determined by a national law, but it is up to each municipality to define the exact location, criteria and intervention strategy. This proposal is then delivered to the national housing and rehabilitation institute for approval, or a specific territorial plan is outlined as a similar pathway for all urban plans. Once effective, owners that launch a rehabilitation operation in their building following the national legislation and provisions of the Urban Regeneration Areas have access to tax benefits (namely the Municipal Tax on property and the Municipal Real Estate Transfer Tax defined by the municipality, but also reduced VAT rates on construction works). They might also have access to funding schemes such as IFRRU, also detailed in this document. Even if each Urban Regeneration Area needs to have a monitoring and evaluation system, no aggregated analysis has been made available – hence evaluation is not straightforward. Still, an empirical analysis, the large number of areas approved (1,359 including thousands of eligible buildings) and the success of the IFRRU mechanism that is strictly linked with this programme point to a high rate of success in triggering renovation. Since most of the operations imply large renovations this also includes significant energy performance improvement, since they must comply with current energy performance of buildings standards.
Assessment of design including accessibility	A crucial success factor is the decentralisation of the policy, i.e. the fact that implementation is actually managed by municipalities or municipal companies designated for this purpose.
Assessment of implementation	The system allows for a streamlining of processes and close cooperation between investors/owners and local authorities, following a concrete set of standards and rules for a very specific area. It therefore diminishes one of the main barriers to investment, which is the regulatory uncertainty surrounding licensing procedures and, above all, the length of the processes.

Romania

Programme 1

Title	Fisa Proiect PNRR - Valul Renovării - Renovare energetică clădiri rezidențiale/Eficiență energetica în clădiri publice
Title (English)	European Structural Investment Fund (ESIF) Regional Programmes – measures for energy efficiency (EE) in buildings (MFB and public buildings) Renovation Wave - Energy renovation of residential buildings Energy Efficiency in Public Buildings

Type	Financial incentive
Description	Energy efficiency funds for moderate to deep renovation measures including, thermomodernisation, change to efficient heating systems, installation of renewable energy systems and charging stations.
Target group	– Home owners' associations (HOAs) are the final beneficiaries and local authorities are the implementing body; and – Public administration (for public buildings) Public funding is 100% on NRRP and <80% for MFB on RPs. Very good reach for public buildings, fair reach for HOAs (MFB).
Eligibility conditions	There are multiple eligibility requirements: – MFBs: local authorities with enrolled HOAs (signed mandates), legal eligibility criteria, MFB not in class I or II of seismic risk, 15% other measures (i.e., measures other than EE targets), feasibility study (including EPC and energy audit report). – Public buildings: public authorities, 15% other measures (i.e., measures other than EE targets), energy from RES for own use only, feasibility study (including EPC and energy audit report).
Budget	NRRP = EUR 2.2 billion (for EE and seismic consolidation, moderate and deep energy renovation), RP 2021-2027 = approximately EUR 1.2 billion
Effectiveness in triggering renovation and achieving energy savings	It is very effective, because of the high level of the grant (80-100%). For HOAs the decision-making process is cumbersome because of the difficulty in reaching consensus.
Assessment of design including accessibility	Accessibility: HOAs are not eligible to apply directly for funding: the local administration has to apply and perform all public procurement (energy audit, design and execution) for the HOA, which is not much involved in the renovation process (even in the decision process). The already traditional 100% public funding leads to a passive attitude from most owners, who are not engaging any more in applying to local authorities for renovation, and are instead waiting for the 'for free' renovation ("like they did for the neighbour"). On the other hand, the funding is used as a political tool, particularly during election years – and, with the intent to do more with less, the targeted performance is lower than it should be. In many cases the renovated building will have to be renovated once again if neutrality is targeted. Authorities should increase the targeted level of performance, diversify the list of eligible measures, open the door to HOAs, connect grants with loans, and communicate the benefits.
Assessment of implementation	Implementation is not always transparent, the owners are not well informed about the status of activities, they are not well involved in the decisions related to the measures included in the renovation project or the performance of installed systems. The quality of works is not followed properly. Authorities should involve HOAs more in the decision-making process during the renovation (e.g. in the selection of measures to be applied and the level of performance), include requirements for an on-site survey, and facilitate compliance.

Programme 2

Title	Casa Eficientă Energetic/Eficiență energetica în clădiri publice
Title (English)	Programmes for financing energy renovation of public buildings ('Energy Efficiency in Public Buildings') and single family buildings ('Energy Efficient House') from AFM (Environmental Fund Administration) Energy Efficient House Energy Efficiency in Public Buildings
Type	Financial incentive

Description	Energy efficiency funds for moderate to deep renovation measures including, thermomodernisation, change to efficient heating systems, installation of renewable energy systems and charging stations.
Target group	– Single family house (SFH) owners and – Public administration (for public buildings)
Eligibility conditions	– For SFH: legal eligibility (extract from the land register, fiscal certificate from national and local tax offices), EPC and energy audit report with proposed measures (within the list of eligible measures). – For public buildings: legal eligibility criteria, list of eligible measures, feasibility study (including EPC and energy audit report).
Budget	– For SFH: the initial budget allocated was around EUR 90 million (2020), which was reduced to approximately EUR 27 million in 2021. Currently applications are closed (so received applications can be evaluated) and there is no information about the implementation of the programme, so it is not clear whether or not the budget has been used up. – For public buildings: the allocated budget was around EUR 300 million (2021). Applications were closed in April 2022 after 150% of the budget was reserved. – Public funding is of 40-60% (based on energy performance targeted, on three levels) but not more than EUR 8,000 (minimum level) to EUR 14,100 (maximum level) for SFH, and 100% for public buildings. – For SFBs preliminary applications were high (approximately 16,000 expressed interest), but final applications were limited. Another funding session is expected to open this year for public buildings and next year for SFBs (with improved guidelines).
Effectiveness in triggering renovation and achieving energy savings	Apparently these programmes were more effective than the other public funding programmes due to a better definition of requirements and the higher performance targeted, while the bureaucracy was also lower. However, the very limited implementation capacity of the funding authority reduced the effectiveness of the scheme.
Assessment of design including accessibility	Accessibility: for SFH, the upfront investment has to be made by the applicant, and the partial grant is reimbursed long after the actual investment, so the target group is rather limited. Communication about the programme is not effective, while implementation problems reduce the appetite of the target group. For public buildings the grant is 100%, so accessibility is only a matter of having the technical and financial capacity to prepare the applications to secure the upfront investment – which is not a big problem for most municipalities. The first session was closed after a relatively short period due to the reservation of the whole allocated budget. The upfront investment has to be made by the applicant and the partial grant is reimbursed long after the actual investment, while no connection to other financial mechanisms is made. The grant is low compared with the targeted performance. The evaluation of the applications takes a long time because of the limited capacity of the funding authority. Authorities should increase the grant to match the high performance level targeted, and provide partial advance payment and/or provide direct links to other financing mechanisms (e.g. commercial loans). They should communicate better and provide information and, if possible, technical assistance to applicants, e.g. by developing OSS to facilitate the supply of integrated renovation services. External expertise and capacity for the evaluation of applications should be contracted.
Assessment of implementation	The interpretation of the funding guide is sometimes not correct, leading to many rejections and reducing the eligible grant. The grants are low compared with the targeted performance level(s). Evaluation and verification capacity is severely limited at the funding authority.

Spain

Programme 1

Title	Plan de Recuperación, Transformación y Resiliencia • Programa de ayuda a las actuaciones de rehabilitación a nivel de barrio • Programa Rehabilitación energética de edificios • Rehabilitación energética de edificios en municipios de reto demográfico • Programa de Impulso a la Rehabilitación de los Edificios Públicos
Title (English)	Four investment programmes under the Recovery, Transformation & Resilience Plan • Programmed Renovation Residential Environment (ERRP) • Programme for the Energy Renovation of Buildings (PREE) • Programme for the Regeneration and demographic challenge (PREE 5000) • Programme to Promote the Renovation of Public Buildings (PIREP)
Type	Financial incentives
Description	Group of programmes financed by NGEU funds under the Plan for Housing Renovation and Urban Regeneration (Component 2). As a specific objective, it seeks to achieve energy renovation rates significantly higher than the current ones, which will make it possible to bring forward compliance with the renovation objectives set out in the National Integrated Energy and Climate Plan (PNIEC) and in the Long-term Strategy for Energy Renovation in the Building Sector in Spain (ERESEE).
Target group	In Component 02 of the Plan, there are 6 investment programmes, 4 of which are related to the energy renovation of existing buildings: - C2.I1: Renovation programmes for the economic and social recovery of residential environments. Target: Subdivided into 3 sub-programmes, i) existing multi-family buildings located in a Programmed Renovation Residential Environment (ERRP); ii) multi-family buildings; and iii) dwellings. - C2.I3: Programme for the Energy Renovation of Buildings (PREE). Target: existing residential buildings. - C2.I4: Programme for the Regeneration and demographic challenge (PREE 5000). Target: existing residential buildings located in municipalities with fewer than 5,000 inhabitants. - C2.I5: Programme to Promote the Renovation of Public Buildings (PIREP). Target: existing public buildings.
Eligibility conditions	The specific requirements in each investment programme are: - C2.I1: i) buildings in a neighbourhood delimited by the corresponding local or regional authority, with at least 50% of the built area above ground level, excluding the first floor, with residential as their main use. ii) buildings with at least 50% of the built area above ground level, excluding the first floor, with residential as their main use, and where the interventions have the agreement of the community of owners. iii) interventions that achieve a reduction of at least 7% of the energy demand for heating and cooling, a 30 % reduction in the consumption of non-renewable primary energy, or the replacement of constructive elements of the facade (thermal envelope) such as windows. - C2.I3: existing residential buildings built before 2007, with at least 70% residential area. - C2.I4: existing residential buildings located in municipalities with fewer than 5,000 inhabitants. - C2.I5: existing public buildings.
Budget	The specific requirements in each investment programme are: - C2.I1: Budget: EUR 3,420 million. Financing: 40%-80% depending on the energy savings achieved. 100% in case of energy vulnerability.

	- C2.I3: Budget: EUR 402.5 million. Financing: envelope (25-35%); devices (25-35%); lighting (15%). - C2.I4: Budget: EUR 92.6 million. Financing: envelope (40-50%); devices (30-40%); lighting (20-30%). - C2.I5: Budget: EUR 600 million.
Effectiveness in triggering renovation and achieving energy savings	There is a low level of effectiveness in some of the programmes, not so much because of the level of funds, but rather because: - Neighbourhood communities are not a mature market, and there has been no prior preparation work with them. - The application process is still complicated. The impression is that the incentives are not going to be taken advantage of in a generalised way, with inequalities between autonomous communities (the Basque Country and Navarra are leading regions in that sense).
Assessment of design including accessibility	Accessibility: funds are transferred to the regional authorities, or local authorities in some specific programmes. Regarding the barriers, each programme works differently. However, there is an overall feeling that the total amount of funds available are not being fully used. The technical criteria for decarbonisation are poorly established. The thresholds of the funds (30%, 45%, 60%) do not meet a technical criterion, and are not related to national decarbonisation targets. Moreover, the thresholds are not framed in a global intervention project of the building: there may be cases of a single intervention that does not achieve the decarbonisation of the building by 2050, or of a deep intervention whose flawed strategy makes further interventions on these elements more complicated. The incentives are general, they do not discriminate between types of communities, especially the more vulnerable. Finally, they are based on high subsidy levels that will be impossible to maintain for the total building stock, and therefore may represent a disadvantage in the future when these levels cannot be reached.
Assessment of implementation	The market is not yet mature. On the other hand, the construction sector is still focused on new construction, and is not ready to carry out the number of necessary renovations. First, to increase the rate of renovation, we must work with neighbourhood communities through networks of OSS, simplifying procedures. For the sector to be prepared, we have to plan these interventions in the long term: by generating a stable intervention demand and training the sector's agents.

Programme 2

Title	ICO MITMA Rehabilitación de Edificios Residenciales
Title (English)	ICO MITMA Rehabilitation of Residential Buildings
Type	Non-financial incentive (Credit guarantee scheme)
Description	Improvement of the financing of renovation actions (Official Credit Institute (ICO) ICO guarantee lines). Creation of financing instruments, through an agreement between the Ministry of Transport, Mobility and Urban Agenda and the ICO, aimed at communities of owners to favour the renovation of their buildings, since they may have difficulties in finding such financing through ordinary channels.
Target group	It is aimed at the population in general and, in particular, at homeowners' associations. The reform has a greater impact on those individuals and households with lower economic resources, who usually have greater difficulties in accessing financing for renovation or improvement of the building stock.

Eligibility conditions	N/A
Budget	N/A
Effectiveness in triggering renovation and achieving energy savings	Actions aimed at promoting green financing, within the framework of a participatory process and dialogue with financial institutions: - Creation of a line of ICO guarantees to partially cover the risks of loans granted by private financial institutions for the rehabilitation of residential buildings. - Promote the approval of specific regulatory measures, including the reform of the Horizontal Property Law, to improve the possibilities of access to financing for homeowners' communities. - Stimulate the implementation of green financing by financial institutions. This incentive is limited to the beneficiaries of the NGEU funds (PRTR), with a specific budget of EUR 1.1 billion. In that sense, its effectiveness is conditional on that of the Plan for Housing Renovation and Urban Regeneration (financial measure 1), which is low in certain programmes.
Assessment of design including accessibility	The conditions of this incentive are favourable.
Assessment of implementation	As mentioned above, it is a well implemented incentive.

Programme 3

Title	OPENGELA[42]
Type	Non-financial incentive (One-stop-shop)
Description	The one-stop-shop is a key tool to overcome the initial barriers to renovation homeowners face, as a district reference source centralising support actions for renovation and complemented by official communication campaigns. In Spain, a reference case for OSS is OPENGELA in the Basque Country.
Target group	It is aimed at the population in general and, in particular, at homeowners who want to renovate their apartment buildings. It also looks to turn them into active participants in the whole renovation process and to accompany them from the start.
Eligibility conditions	N/A
Budget	N/A
Effectiveness in triggering renovation and achieving energy savings	The OPENGELA OSS model is intended to centralise all the procedures and administration related to the process of integrated renovation of apartment buildings, from administrative paperwork to dealing with energy services contractors or the provision of financial aid. The model is complemented with other tools aiming to promote renovation: – Guides and manuals on aspects related to energy renovation – Observatories, forums and working groups – Web platform aimed at companies and agents in the sector that includes good practices in the field of energy renovation – Specific information and communication campaigns, which may include campaigns aimed at setting up regional or local renovation offices.

[42] Developed via the EU-funded HIROSS4all project 2019-2023 in the Basque Country.

	The OPENGELA model has been implemented in two districts so far, with impressive results: 30 multi-family buildings renovated (425 dwellings), 927 neighbours mobilised in the OSS, 4.25 GWh/year saved, 945 tC02/year saved, EUR 15.16 million obtained (works + projects), 44 direct and indirect employments generated.
Assessment of design including accessibility	The success of the OPENGELA model is based on three main pillars: – proximity as a master key – management mechanism: key to the replicability of the model – financial mechanism: key to the sustainability of the model. The OPENGELA model has received many international and national awards. There are currently plans to replicate it in a total of 23 districts in the Basque Country, comprising more than 3,000 dwellings.
Assessment of implementation	As mentioned above, the model is based on three pillars that have ensured its success from a qualitative point of view, establishing a solid framework of citizen confidence, lasting management, and economic and financial stability.

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