

Benchmarking for mobilising investments in energy efficiency

ENER/C3/2017-442 – Topic 2

Benchmarking of different financial instruments to unlock
private financing for energy renovation, also in the context of
supporting the most vulnerable consumers

EUROPEAN COMMISSION

Directorate-General for Energy
Directorate B – Just Transition, Consumers, Energy Efficiency and Innovation
Unit B2 – Energy Efficiency

E-mail: ENER-ENERGY-EFFICIENCY@ec.europa.eu

*European Commission
B-1049 Brussels*

Benchmarking for mobilising investments in energy efficiency

ENER/C3/2017-442 – Topic 2

Benchmarking of different financial instruments to unlock private financing for energy renovation, also in the context of supporting the most vulnerable consumers

Manuscript completed in July 2021

LEGAL NOTICE

This document has been prepared for the European Commission however it reflects the views only of the authors, and the European Commission is not liable for any consequence stemming from the reuse of this publication. More information on the European Union is available on the Internet (<http://www.europa.eu>).

PDF	ISBN 978-92-76-53625-3	doi: 10.2833/175772	MJ-08-22-197-EN-N
-----	------------------------	---------------------	-------------------

Luxembourg: Publications Office of the European Union, 2022

© European Union, 2022



The reuse policy of European Commission documents is implemented by the Commission Decision 2011/833/EU of 12 December 2011 on the reuse of Commission documents (OJ L 330, 14.12.2011, p. 39). Except otherwise noted, the reuse of this document is authorised under a Creative Commons Attribution 4.0 International (CC-BY 4.0) licence (<https://creativecommons.org/licenses/by/4.0/>). This means that reuse is allowed provided appropriate credit is given and any changes are indicated.

For any use or reproduction of elements that are not owned by the European Union, permission may need to be sought directly from the respective rightholders.

Table of Contents

1. Executive summary.....	1
2. Objectives	6
3. Methodology	7
3.1 Selection process	7
3.2 Final selection	10
3.3 Benchmarking methodology and indicators	10
4. Context.....	11
5. Case studies	12
5.1 Latvian Baltic Energy Efficiency Facility	13
5.1.1 Context	13
5.1.2 Programme design and setup	14
5.1.3 Financial mechanisms	16
5.1.4 Impact.....	17
5.1.5 Co-benefits	17
5.1.6 Success factors and barriers.....	18
5.2 Flemish Revolving Energy Fund – energy loans with delayed repayment for vulnerable owners	19
5.2.1 Context	19
5.2.2 Description of the financial instrument.....	20
5.2.3 Financial mechanisms	22
5.2.4 Impact.....	24
5.2.5 Co-benefits	24
5.2.6 Success factors and barriers.....	25
5.3 KredEx	26
5.3.1 Context	26
5.3.2 Description of the KredEx Fund and its main instruments	27
5.3.3 Main characteristics of KredEx renovation grant scheme	29
5.3.4 Impact.....	31
5.3.5 Co-benefits	32
5.3.6 Success factors and barriers.....	33
5.4 JESSICA 2	34
5.4.1 Context	34
5.4.2 Description of the financial instrument.....	35
5.4.3 Financial mechanisms	36
5.4.4 Impact.....	38
5.4.5 Co-benefits	38
5.4.6 Success factors and barriers.....	40
5.5 New Green Savings Programme	42
5.5.1 Context	42

5.5.2 Programme design and setup	43
5.5.3 Financial Mechanism	44
5.5.4 Impact.....	45
5.5.5 Co-benefits	45
5.5.6 Success factors and barriers.....	46
6. Benchmarking and key success factors	46
6.1 Introduction	46
6.2 Relative indicators	47
6.3 Success factors	50
6.3.1 Information and marketing phase	50
6.3.2 Project design or sales phase	51
6.3.3 Application phase	52
6.3.4 Construction phase	52
6.3.5 Evaluation and redesign phase	53
7. Policy recommendation and complementary measures	55
7.1 Background	55
7.2 Recommendations on the EU level	56
7.2.1 Conclusion	58
7.3 Recommendations on the Member State level	58
7.3.1 Conclusion	61
8. Bibliography	61
8.1 Summary.....	61
8.2 Case studies	61
8.2.1 LABEEF, Latvia	61
8.2.2 Flemish Revolving Energy Fund, Belgium.....	62
8.2.3 KredEx, Estonia	62
8.2.4 JESSICA 2, Poland.....	63
8.2.5 NGS Programme, Czech Republic.....	63
8.3 Policy recommendations	65

1. Executive summary

In its impact assessment of the 2030 climate target, the European Commission estimates that to achieve the increased 2030 targets, average annual investments of about €350 billion (55% climate target) will be needed between 2021 and 2030 compared to 2011-2020, particularly in the areas of energy efficiency, renewable energies, and sustainable infrastructure.

Due to the ongoing COVID-19 pandemic, the challenges and priorities of the EU and the future EU budget have shifted significantly. The Multiannual Financial Framework (MFF) and the Next Generation EU (NGEU) combined will provide more than €1.8 trillion. To bring the EU budget more closely in line with 2030 EU climate and energy goals and a complete decarbonisation by 2050, at least 30% of the next MFF and NGEU will be directed towards climate change mitigation and adaptation. Climate expenditure will be around €550 billion, which is around 2.5 times the climate expenditure of the current MFF.

The Recovery and Resilience Facility (RRF) is the centrepiece of the NGEU and will provide €672.5 billion to support investment and reforms, 37% of which will be directed to climate action. While Member States have drawn up their plans, the focus of the RRF related to the European Green Deal is:

- Power up (renewables)
- Renovate (energy efficiency in buildings)
- Recharge and Refuel (sustainable transport)

Under the Renovation Wave, a flagship initiative under the European Green Deal, the Commission encourages Member States to use EU financial resources to implement national, regional, and local support schemes for stimulating quality building renovation, leveraging private investment, providing technical assistance, and deploying attractive financial products for building renovation (European Commission 2020).

Despite this significant support from the EU budget to unlock investment into building renovation, the challenge remains to mobilise the necessary private investments, fill up the pipeline with corresponding renovation projects, and create programmes and instruments that attract different types of investors.

This benchmarking study aims to analyse existing successful and innovative financial instruments used to finance energy efficiency measures in the building sector. Based on this analysis, policy recommendations for improving the current practices in Member States and at the EU level can be derived and new policies developed to support the doubling of the annual renovation rate in the EU and to enable high quality renovations. The study was accompanied by an intensive stakeholder process from different countries and institutions.

Based on a three-step selection process, the following case studies were selected. The schemes differ significantly from each other in terms of the financial instrument used, target group, supported measures, age of the scheme, etc. Each case study is based on an extensive literature review, available evaluations, and interviews with different stakeholders, such as implementing agencies and banks.

Table 1: Comparison of main programme features

Scheme	Type of Instrument				Target Group			Ambition Level of Energy Efficiency			Supported Measures			
	Grant	Loans	Guarantees	EPCs	Single-family houses	Multifamily houses	Public buildings	Shallow	Medium	Deep	Insulation	New construction	Switch to renewable energy	Energy efficient heating system
Flemish Revolving Energy Fund														
JESSICA 2 Loans														
KredEx														
LABEEF														
NGS Programme														

The main characteristics and key findings are summarised as follows:

- Latvian Baltic Energy Efficiency Facility (LABEEF), Latvia:** Energy performance contract-based financing model for deep energy efficiency measures in multi-apartment buildings in Latvia.
 - Market-funded facility for enabling energy service companies (ESCOs) to provide deep energy efficiency measures through long-term energy performance contracts.
 - The main benefit of this facility is to separate the execution of the project from funding, allowing ESCOs to accept the terms of a long-term repayment schedule while being able to take on additional projects.
 - Promising concept for countries with a large stock of multifamily apartment buildings.
- Flemish Revolving Energy Fund, energy loans with delayed repayment for vulnerable owners, Belgium:** Newly (2019) created funding line for energy efficiency renovations for low-income households.
 - Pilot of funding home renovation to emergency buyers.
 - Funding by the Ministry of Energy, fund management by the Flemish Energy Agency, and implemented by local actors.
 - Funding directly to the contractor, not to the homeowners.
 - Homeowners pay back the funding when house is sold or, at maximum, after 20 years.
- KredEx, Estonia:** Renovation grants for residential buildings in Estonia that support all-inclusive and wide-ranging renovation.
 - The KredEx Foundation was established in 2001; in 2009, the Foundation established the KredEx Revolving Fund, which started providing energy

renovation support to residential buildings in Estonia through a combination of loans, loan guarantees, and grants.

- The grant scheme went through constant improvements based on experiences from preceding financing periods, eventually reaching high impact on residential Estonian building stock. In the second and third financing periods (2010 and onwards), grants were linked to targeted energy performance following the higher-savings-higher-grant principle, leading to 40% average energy savings.
 - Over time, the role of Technical Assistance (TA) and its support for renovation was constantly emphasised and strengthened. Eventually, TA started having a crucial influence on the energy savings and financial sustainability of the investments realised through the grant scheme.
 - The customer journey has been constantly improved with strong involvement of local banks, TA experts, and contractors. The purpose was to make the application process easier and to reduce risks perceived by project participants. A significant part of the journey was raising awareness, which helped homeowners associations decide their renovation intentions and enter the financing process.
4. **JESSICA 2 Loans, Poland:** Simple one-stop shop for loans enabling energy efficiency renovations in multi-apartment buildings.
- Lean and mean loan scheme for renovation measures.
 - Bank Gospodarstwa Krajowego (BGK) serves as a one-stop shop.
 - Total loan instrument of €40 million for both apartments and public buildings.
 - Minimum energy savings of 25% leads to discount on interest rate by higher energy savings.
 - Strong assessment upfront by certified persons on the project and at BGK.
5. **New Green Savings (NGS) Programme, Czech Republic:** Broad investment subsidy for single and multifamily houses across the Czech Republic.
- Funded mainly through the proceeds of unused EU Emission Trading System (ETS) certificates.
 - The amount of the funding depends on the calculated energy savings before and after the implementation.
 - Licensed specialists provide advice and guarantee quality.
 - Projects are prefinanced; grants are only disbursed after an ex post evaluation.

Based on these case studies, success factors along all phases of a financial scheme—starting with the information and marketing until the evaluation or redesign—were identified; these factors might support the assessment and adjustments of current practices in Member States and at the EU level.

Table 2: Overarching success factors of financial instruments

Information/Marketing Phase	Project Design/Sales Phase	Application Phase	Construction Phase	Evaluation/Redesign Phase
<ul style="list-style-type: none"> • Create a one-stop shop for energy efficiency support. • Enable compatibility with other programmes to increase impact. • Clearly communicating costs and benefits (including non-energy benefits) for participation is needed, ideally supported through an external evaluation/study. • Self-qualification for a scheme can help to target a specific group and simplify application procedures. • Publicise the programme information and the benefits to households, construction companies, installers, architects, and ESCOs through multiple channels (on the ground, local agencies). 	<ul style="list-style-type: none"> • Proactive follow-up through the scheme or implementing agency to close the sale. • Provide some form of technical assistance that can also support the applicant—e.g. through a network of licenced experts. • Develop an individual building renovation passport for each homeowner. • Request mandatory energy audits or technical assistance before defining measures that will be put into the project design. • Focus on multiple benefits from renovation (health, safety, energy efficiency). • Depending on the programme and legal setup, proactively market to HOAs. 	<ul style="list-style-type: none"> • Easy and straightforward online application procedure through existing channels such as house banks, energy providers, or one-stop shop. • Link the level of support to achieved savings to incentivise deeper renovation measures. • Provide special support for tenant management in multi-apartment projects with fragmented ownership structure (applicable only to multifamily housing schemes). 	<ul style="list-style-type: none"> • Prefinancing schemes are difficult for lower incomes to participate in. Provide special options for low-income households if general scheme setup is prohibitive for lower incomes. • High quality technical assistance of the construction works through a network of licensed actors. • (Partially) Reimburse cost of assistance through the programme. 	<ul style="list-style-type: none"> • Require an ex post evaluation through a technical assistance network if technical assistance was not already provided throughout the scheme. • Evaluate entire scheme to identify possible improvements, including customer journey. • Ensure that support for low-income households does not reduce general welfare payments. • Enable legal framework for energy performance contracting (EPC) based on private sector initiatives or other innovative solutions, such as on-bill financing or energy efficiency mortgages. • Funds and requirements to be linked to renovations needed for 2050 standards.

Next to the identified overarching success factors that are aimed at designing financial schemes well, further policy recommendations are given to stimulate quality building renovation, leverage private investment, and deploy attractive financial products for building renovation.

In general, three recommendations on the EU level are outlined:

- Harmonise the financing guidelines (standards and targets) across its various financing instruments and targets.
- Develop and provide proper reporting, requesting information to allow for both an evaluation of the process and the impact of various financial instruments; support transparency.
- Facilitate the exchange between Member States so that leading practices can be easily adapted and implemented by other Member States.

These EU-level recommendations can be applied on a Member State level as well as overall specifications; other recommendations, such as the implementation of new and innovative programmes, are targeted more to a national level.

1. Harmonise the standards and requirements of different national schemes with a soon-to-be harmonised EU framework, most likely through the sustainable finance taxonomy as a minimum standard.
2. Pool, coordinate, and incentivise the use of different financial instruments and, where needed, test new innovative solutions.
3. Align the national sector targets, if existing, with the EU targets, namely the renovation wave in the medium term and the 2050 goals in the long term.
4. Monitor and regularly evaluate the schemes, both in terms of impact and process; and if need be, adjust accordingly.
5. Set up platforms to work closely with the financial sector and to advance further capacity building in both the financial and public sectors.

Testing new financial instruments could be an applicable approach if existing ones are no longer suitable or deemed inefficient.

Table 3: Type of financial instruments for building renovations

	Traditional and well-established	Tested and growing	New and innovative
Non-repayable reward	Grants and subsidies Tax incentives	Energy efficiency obligations Pay-for-performance support schemes	Energy efficiency feed-in-tariffs
Debt financing	Soft loans Leasing	Energy performance contracts (EPCs) Energy service agreements Revolving funds Commercial loans	Energy efficient mortgages Property Assessed Clean Energy Program (PACE) On-bill finance Crowdfunding Energy savings tenders Energy savings tariffs
Equity financing		EPCs Energy service agreements	Crowdfunding

Bold instruments highlighted by the authors to indicate the instruments discussed in the case studies.

Source: Adapted from Economidou, Marina; Todeschi, Valeria; Bertoldi, Paolo (2019): Accelerating energy renovation investments in buildings. Financial and fiscal instruments across the EU. Luxembourg: Publications Office of the European Union (JRC Science for Policy Report, 29890).

On an EU level, numerous initiatives and funds are already on the right path for financing energy efficiency measures. The focus should be on continuing and extending its existing efforts, such as MFF and NGEU and capacity building for the public and financial sectors and across Member States. This exchange on different financial instruments can speed up the EU-wide implementation and delivers valuable information on how to make the best use of these for different types of investors in energy efficiency in buildings. The EU-wide implementation of the taxonomy will create a level playing field for energy investments by financial institutions across all Member States. Member States should provide clear and comparable standards for all their programmes, easy-to-use programmes, and straightforward benefits. Furthermore, programmes should be externally evaluated on process and impact.

2. Objectives

In its impact assessment of the 2030 climate target, the European Commission estimates that to achieve the increased 2030 targets, average annual investments of about €350 billion (55% climate target) will be needed between 2021 and 2030 compared to 2011-2020, particularly in the areas of energy efficiency, renewable energies, and sustainable infrastructure.

Due to the ongoing COVID-19 pandemic, the challenges and priorities of the EU and the future EU budget have shifted significantly. The Multiannual Financial Framework (MFF) and the Next Generation EU (NGEU) combined will provide more than €1.8 trillion. The Renovation Wave, a flagship initiative under the European Green Deal, encourages Member States to use EU financial resources to implement national, regional, and local support schemes for stimulating quality building renovation, leveraging private investment, providing technical assistance, and deploying attractive financial products for building renovation.

Despite this significant support from the EU budget to unlock investment into building renovation, the challenge remains to mobilise the necessary private investments, fill up the pipeline with corresponding renovation projects, and create programmes and instruments that attract different types of investors.

The objectives of this benchmarking study are to provide Member States and associated key stakeholders with an overview and quantitative and qualitative analysis of existing successful and innovative financial instruments used to finance energy efficiency measures in the building sector. This analysis will help to derive policy recommendations for improving the current practices related to financial instruments in Member States and at the EU level and for developing new policies. It also fosters cooperation and knowledge sharing between the Member States and stakeholders involved in this study.

3. Methodology

3.1 Selection process

To analyse the existing energy efficiency financing approaches, an exhaustive literature review was conducted on finance sources, existing energy efficiency projects that have successfully managed to secure public funding and programmes, and case studies on best practices. Sources such as the MURE and IEA databases as well as the programmes and best practice case studies outlined in the inception report were looked at. The desk research was complemented by requests to the survey participants for specific input, especially regarding national funds and with a view to further possible case studies. The case studies have been screened to focus on previously selected countries.

1. Financing sources

We first looked at available international and EU funds that finance energy efficiency measures in buildings:

- European structural and investment funds (ESIFs)
- JESSICA / fi-compass
- Horizon 2020
- LIFE Programme
- PF4EE (under LIFE)
- Project development assistance (European Local ENergy Assistance, or ELENA)
- European Fund for Strategic Investments (EFSI)
- European Energy Efficiency Fund (EEEF)
- External blending facilities

2. Energy efficiency projects and programmes that have successfully managed to secure public funding

Examples for screened projects and programmes are presented as follows:

- KredEx in Estonia
- SUNSHINE project
- New Green Savings (NGS) Programme, 2014-2020, in Czech Republic
- Thermal Modernisation and Refurbishment Fund in Poland
- Programme for thermal rehabilitation of the blocks of flats funded from structural and cohesion funds in Romania

- Grant for renovation of district heating boilers (2016-2020) in Estonia
- Funding of energy efficiency in buildings in Croatia

3. Existing case studies on leading practices

Examples for existing case studies on energy efficiency leading practices that we screened are listed in Table 4:

Table 4: Case studies on leading practices

Author	Year	Title	Available online at
Buildings Performance Institute Europe (BPIE)	2016	Accelerating the renovation of the Bulgarian building stock	Link to report
CPI	2014	Early Lessons on Introducing Energy Performance Contracts in Italy: Milan's Energy Efficiency Programme.	Link to report
European Commission	2016	Good practice in energy efficiency. For a sustainable, safer and more competitive Europe.	Link to report
European Commission	2015	Monitoring of energy efficiency trends and policies in the EU, an analysis based on the ODYSSEE and MURE databases.	Link to report
The World Bank	2014	Residential Energy Efficiency Programme in Lithuania	Link to report
The World Bank	2013	Energy Efficiency, Lessons Learned from Success Stories	Link to report
United Nations Economic Commission for Europe	2015	Analysis of National case studies on policy reforms to promote energy efficiency investments	Link to report
Ecofys/adelphi	2018	Series of best practice examples of climate policies and instruments in several European countries	Link to report

4. Input on energy efficiency best practices from the survey

The following list specifies the input on energy efficiency best practices collected from the survey:

- Belgium: Revolving fund for vulnerable owners
- Bulgaria: Urban Development Funds
- The Netherlands: BetterHome Programme
- Estonia: KredEx fund
- Italy: European Energy Efficiency Fund
- Latvia: Latvian Baltic Energy Efficiency Facility (LABEEF)
- Lithuania and Poland: JESSICA funds
- Romania: Casa Buhnici

- Slovakia: Financing multifamily building renovations

We then defined criteria to select the case studies for a long list. These criteria included the following:

- Size of investments (total investments in energy efficiency above €1 million)
- Data availability
- Significance of energy savings achieved
- Programme style (targeting multiple projects)

We looked at more than 50 potential case studies, 17 of which were included on the long list because they met at least three of the four criteria. Some of the potential case studies had not achieved significant energy savings because they had been implemented recently. However, these funds and programmes had innovative elements, offered a range of co-benefits, or had large funding volumes.

We then prepared a preliminary list (medium list) with eight case studies from the long list; we briefly summarised each respective project or programme and the preliminary results for the long and short list criteria. The additional short list criteria include the following:

- Multifamily houses targeted
- Private finance leveraged
- Deep renovations carried out
- Co-benefits (e.g. energy poverty alleviation, job creation, improved quality of housing)
- Innovative approach (e.g. use of energy service companies [ESCOs], combined with TA, awareness raising)

The medium list includes potential case studies from a range of EU countries and represents various energy efficiency financing approaches.

The preselected cases are:

- Flemish Revolving Energy Fund (Belgium)
- KredEx fund (Estonia)
- Slovak Sustainable Energy Financing Facility (SlovSEFF) (Slovakia)
- New Green Savings (NGS) Programme 2014 (Czech Republic)
- Latvian Building Energy Efficiency Facility (LABEEF, Latvia)
- Energy Efficiency in social housing – Frederikshavn Housing Association (Denmark)
- Thermal Modernisation and Refurbishment Fund (Poland)
- JESSICA funds (Poland)

We presented the medium list to the Steering Group members and asked them to provide feedback on their top three case studies to learn more about. Based on this feedback and a discussion that followed, five case studies were selected for the in-depth analysis. These case studies are described in detail in section 5.

3.2 Final selection

Preselected case studies were discussed and further developed by any Steering Group members involved in the project or programme. Participants were invited to discuss the benchmarking methodology, which brought up a fruitful discussion on criteria and indicators. Steering Group members then voted on the cases most interesting to them or this study.

After discussion, the Steering Group selected the following case studies:

- LABEEF (Latvia)
- Flemish Revolving Energy Fund (Belgium)
- KredEx fund (Estonia)
- JESSICA funds (Poland)
- NGS Programme (Czech Republic)

The five case studies selected include a mix of different financial instruments and long- or short-running programmes, some of which with adjustments already made.

Table 5: Selected case studies (finance)

Location	Selection Criteria
LABEEF (Latvia)	<ul style="list-style-type: none"> • Only recently implemented but interesting example of supporting ESCOs that implement renovation measures in multifamily buildings based on energy performance contracting (EPC). • EPCs can include the development of energy concepts, financing, and training.
Flemish Revolving Energy Fund (Belgium)	<ul style="list-style-type: none"> • Instrument for addressing the population with no access to financing for renovation purposes. • Create a framework including the funding with public means, the way of reimbursement, and the cooperation with local welfare institutions. • Only recently implemented but interesting example focusing on addressing energy poverty and innovative elements such as delayed repayment.
KredEx fund (Estonia)	<ul style="list-style-type: none"> • Deep renovations of existing apartment buildings are carried out. • Beneficiaries can obtain grants up to 50% of the expenses for energy audit and building expert evaluations and project design documents. • Through focused and intense promotional activities, the fund has been instrumental in increasing energy efficiency awareness.
JESSICA funds (Poland)	<ul style="list-style-type: none"> • The European Investment Bank (EIB) manages financial instruments under the Regional Operational Programme (ROP) with the task to invest ESIF resources through financial intermediaries into eligible projects in urban regeneration and energy infrastructure.
NGS Programme (Czech Republic)	<ul style="list-style-type: none"> • High total investments in energy efficiency. • Significant energy savings achieved. • Several innovative elements including an increase in electronic communication and documentation and reduced administrative barriers through simplification.

3.3 Benchmarking methodology and indicators

The following provides the indicators that have been presented, adapted, and finally agreed in the stakeholder meetings.

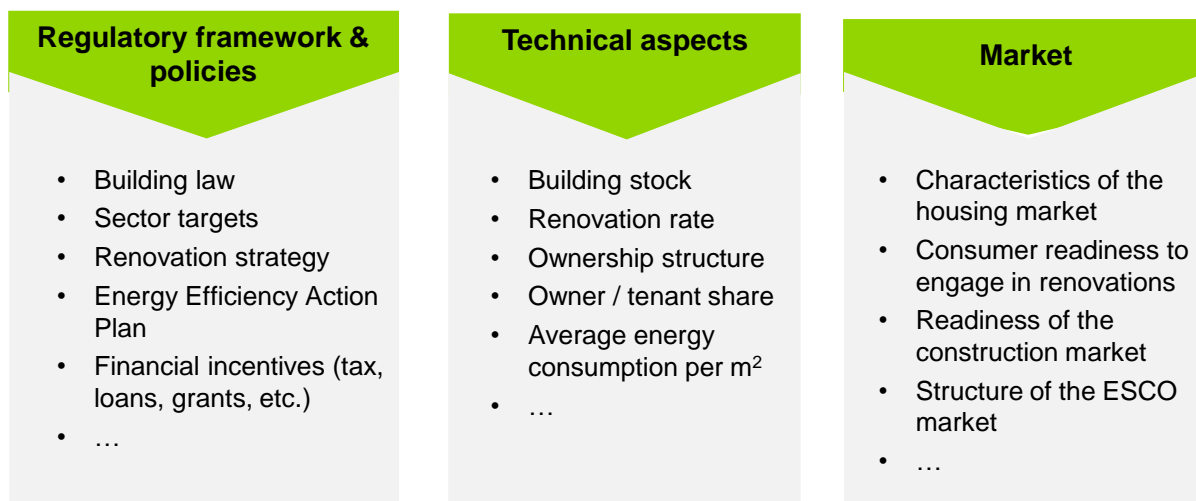
Table 6: Quantitative and qualitative indicators

Policy/Legal	Economic	Technical	Additional
Legal framework for national funding of energy efficiency measures in place	Return on investments (monetary savings from energy investments [€]/ investment costs [€])	Quality of works (e.g. confirmed by survey among occupants after the renovation) (high/medium/low)	Scalable to other projects and context (yes/no)
	Total investments in energy efficiency measures (€)	Percentage of saved energy (saved energy [kWh]/energy used prior to the investment [kWh])	Supported vulnerable consumers (addressed energy poverty)
	Private finance leverage factor (1:X) Additional investments realised (%)	Amount of energy saved (kWh)	Social impact (jobs created [#], health improvement)
	Investment per m ²	Amount of CO ₂ savings (tCO ₂) Share of renewable energy consumption (%)	Consumer demand/ awareness-raising
	Number of projects realised (buildings renovated) (#)		Behaviour change: are there investments independent of grants?

A few questions were asked during the Steering Group session to understand how to measure qualitative aspects and on the project focus (the case studies focus on multifamily housing and single-family housing).

4. Context

Figure 1 provides an overview of the national framework conditions for the financial instrument investigated to be considered in the analysis. The specific context is treated in the respective case study section.

Figure 1: Context factors


5. Case studies

Five case studies were prepared for topic 2. The five case studies present a different approach to financing and providing energy efficiency measures. The schemes differ significantly from each other in terms of financial instrument used, target group, supported measure, age of the scheme, etc. Each case study is based on an extensive literature review and interviews with different stakeholders, such as implementing agencies and banks. Where available, formal evaluations were included in the analysis. Collected data is therefore a mixture between publicly available and internal data sources. The five case studies in topic 2 are as follows:

1. **LABEEF (Latvia):** Energy performance contract-based financing model for deep energy efficiency measures in multi-apartment buildings in Latvia.
2. **Flemish Revolving Energy Fund (Belgium):** Newly (2019) created funding line for energy efficiency renovations for low-income households.
3. **KredEx (Estonia):** Renovation grants for residential buildings in Estonia that support all-inclusive and wide-ranging renovation.
4. **Jessica 2 Loans (Poland):** Simple one-stop shop for loans enabling energy efficiency renovations in multi-apartment buildings.
5. **NGS Programme (Czech Republic):** Broad investment subsidy for single and multifamily houses across the Czech Republic.

To capture the entire depth of the analysed schemes the case study template was refined slightly to better fit with the available data. For example, no scheme evaluated the broader context such as the readiness of the construction market to engage in renovations. Therefore, this section was left out of the case studies. For some schemes such as the Flemish Revolving Energy Fund, NGS, or LABEEF, it was also difficult to acquire some of the broader quantitative indicators because no quantitative data could be collected (e.g. for CO₂ savings and co-benefits). This lack of available quantitative indicators and the lack of comparability of the different financial schemes also led the corresponding analysis to focus on success factors and barriers for energy efficiency schemes instead of a quantitative benchmark of the financial instruments.

5.1 Latvian Baltic Energy Efficiency Facility

Summary

- Market-funded facility for enabling ESCOs to provide deep energy efficiency measures through long-term energy performance contracts.
- The main benefit for the facility is the separation of execution from funding, allowing ESCOs to accept the terms of a long-term repayment schedule while being able to take on additional projects.
- Promising concept for countries with a large stock of multifamily apartment buildings.

5.1.1 Context

The Latvian housing stock of 39,000 multifamily buildings is largely dominated by prefabricated high-rise apartment buildings that were constructed between 1941 and 1992 by the Soviets. Around 95% of these are estimated to need deep renovation measures due to their low energy efficiency and insufficient maintenance (Jörling & Schäfer, 2018).

The Latvian housing market was rapidly privatised after fall of the Soviet Union; by 2002, around 83% of dwellings were under private ownership (Pittini & Laino, 2011). This fragmented ownership structure often makes larger investments in maintenance difficult to implement, leaving many buildings inefficient and slowly decaying.

Average energy consumption of the building stock is between 160 and 180 kWh/m² annually (Miežis, Zvaigznītis, Stancioff, & Soeftestad, 2016). If correcting for seasonal extremes, Latvian households show a slowly decreasing energy consumption over the past 6 years, with wood as heating fuel accounting for 37.7% of household energy consumption (EC, 2019). The energy-related renovation rate as a percentage of stock in the residential sector was 9.8% between 2012 and 2016 (Ipsos; Navigant, 2019). The majority of these renovations (5.4%) were below 3% savings in primary energy consumption or showed only light savings (3.4%)—i.e. below 3%-30% reduction in primary energy consumption through the renovation. The renovation rate for medium energy efficiency measures with savings between 30% and 60% was just 0.9% and for deep renovation measures with above 60% savings, the rate was essentially 0% (Ipsos; Navigant, 2019).

The Latvian ESCOs market consists of around 50-60 companies and largely depends on subsidies. Only a few companies offer EPCs (JRC, 2017).

Latvia has a 2020 energy efficiency target of final energy savings of 0.457 Mtoe, which relates to a building renovation target of 678,469 m² by 2020. The country wants to bring down the specific heat consumption of buildings to 150 kWh/m²/year by 2020, and to 100 kWh/m²/year by 2030. To achieve these targets, Latvia has several measures in place. These measures range from energy efficiency requirements for district heating systems to an energy efficiency certification scheme, informational campaigns, and operational programmes to increase energy efficiency in public buildings (Odyssee-Mure, 2020). The LABEEF-comparable Apartment Building Energy Efficiency Programme (DME) provides free energy consultations and grants for up to 50% of energy efficiency renovations in multi-apartment buildings. The programme, which is administered by the state-run development finance institution ALTUM, runs until December 2023, and provides €136 million (ALTUM, 2019). While LABEEF does not provide any energy consultations, both programmes target

multifamily apartment buildings.

5.1.2 Programme design and setup

LABEEF is a private fund created in 2016 by the investment management company Funding for Future (F3). It was created to support ESCOs that conduct deep renovation measures on apartment buildings in Latvia. It is complemented by the Building and Energy Conservation Bureau (ESEB), which is a nongovernmental organisation (NGO) specialising in facilitating EPCs.¹ While LABEEF is responsible for the financials, ESEB is the organisation in contact with tenants and homeowners. LABEEF also works with Ekoburojs, an independent NGO representing residents' interest. There is no specific regional focus of the facility, and plans exist to expand to other countries.

LABEEF finances long-term payment cash flows backed by an EPC. Energy performance contracting is a financing scheme offered by ESCOs to building owners in need of energy efficiency improvements but have limited financial means or technical capacities to implement such projects on their own. What makes EPC innovative is that an ESCO finances the project based on the guaranteed energy savings that will be generated in the future. The renovation can be financed by the company in form of equity or from a bank, which provides a loan to an ESCO, or a combination of both. LABEEF does not finance any renovation itself—it only provides long-term financing. The renovation cost is paid by the owners (e.g. the inhabitants of the apartment building) through monthly instalments linked to the achieved savings outlined in the EPC. The renovation can also be partially financed by grants and subsidies, in which case only the EPC component linked to energy savings is paid back by buildings owners.

Figure 2 illustrates the LABEEF project lifecycle. The project cycle can be divided into three phases: project development, construction, and settlement. Project development and implementation are carried out by an ESCO or a private project developer.

In the project development phase, the ESCO or LABEEF identifies a suitable apartment building. Once a suitable building is identified, an agreement with the building's residents needs to be reached, which is often done through a housing association. All owners must agree to the renovation. This can be a difficult step given the multiparty ownership structure common in Latvia. In this process, the nonprofit nature of ESEB and Ekoburojs prove to be a valuable intermediary between cautious tenants and the ESCO and LABEEF. ESEB and Ekoburojs play an important role through their engagement of residents in the initial acquisition and as conflict mediator between residents and the ESCO during the entire process.

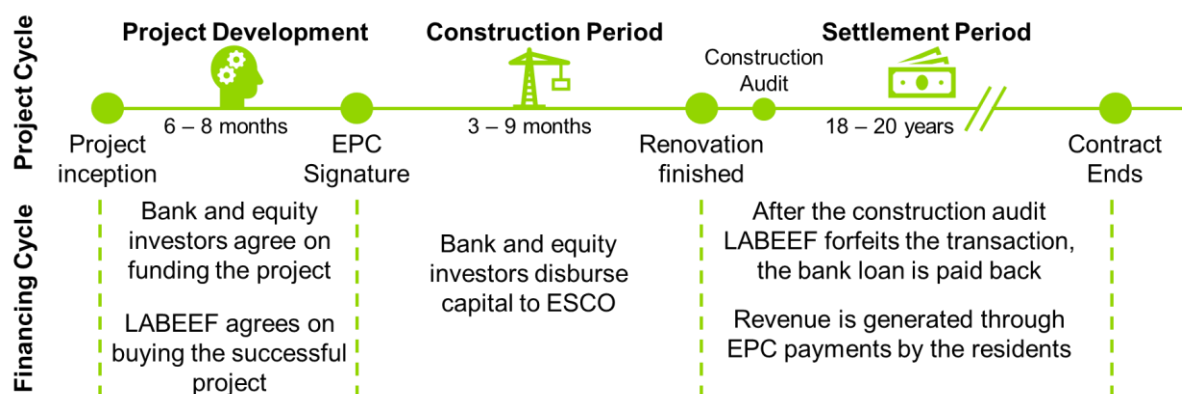
The agreement with the building residents is complemented by another agreement with LABEEF to finance the contract upon completion of a successful ex post audit. The ESCO or project developer uses a regular loan from a commercial bank to finance the construction period or partially finance it themselves through equity. Once all contracts are signed, the construction period can begin. After completing the renovation measures and one heating season, an independent consultant, as agreed by LABEEF, performs an energy work audit. If the project has been implemented as agreed and energy savings have been achieved, LABEEF buys the future revenue from the EPC for up to 80%. The remaining 20% remain to be received by the ESCO or the bank if the renovation was financed through a loan.

The EPCs are paid by the residents in monthly instalments, which are linked to actual

¹ More information about ESEB is available at its website: <http://ekuburojs.lv/en/home-eseb/>.

energy savings. EPCs have a lifetime of up to 20 years, after which the savings from lower energy consumption are passed on to the residents directly. The difference between the low ex post energy consumption and the monthly EPC fee is shared between the ESCO and LABEEF to cover costs and make a profit. Figure 2 provides further details on the financial flows during the different periods.

Figure 2: LABEEF Project Lifecycle



Source: Guidehouse based on Stancioff, 2019

LABEEF offers three different EPC packages:

- Standard, consisting only of energy efficiency measures
- EPC+, which includes additional investments such as renovating a staircase
- EPC++, which also includes renovations to the sidewalk, exterior lightning, and other amenities

Only the EPC+ and EPC++ contracts are being implemented (Stancioff, Director Funding for Future, 2020). Additional examples of energy efficiency measures that are supported are: modernisation of heat exchanger substations, heating insulation, solar window treatment, and passive solar devices; improvements to mechanical heating, ventilation, and air conditioning (HVAC); and improvements to interior and exterior lightning. Renovation measures must bring a minimum increase in energy efficiency of 50% to be considered by LABEEF.

The project acquisition is conducted by ESCOs and LABEEF through active scanning for suitable projects and engagement with residents to convince them of the benefits of having a healthy and warm home. The most common private ownership structure in the Latvian residential sector makes it necessary for many marketing measures to happen at the personal level. This type of marketing allows the ESCOs and LABEEF to overcome distrust and prejudice of the residents against the fear of rising electricity prices through the EPC. Stakeholder engagement throughout the duration of the EPC is provided by the NGO Ekoburojs, which represents the interest of the residents and acts as conflict mediator. Ekoburojs plays a key role in the successful relationship between residents and the ESCO and LABEEF. The ESCO remains liable for the project throughout the settlement phase and continues to maintain the project from a technical perspective.

F3 is contemplating setting up LABEEF-like investment facilities in Austria, Slovakia, Bulgaria, Poland, and Germany (Stancioff, Green Buildings - Scalable Financial Instrument - Delivering a European Building Energy Efficiency Facility, 2019). Many of the former Soviet republics in Eastern Europe feature a similar housing stock with a large share of prefabricated multi-apartment buildings, and high energy costs are required for the EPCs to

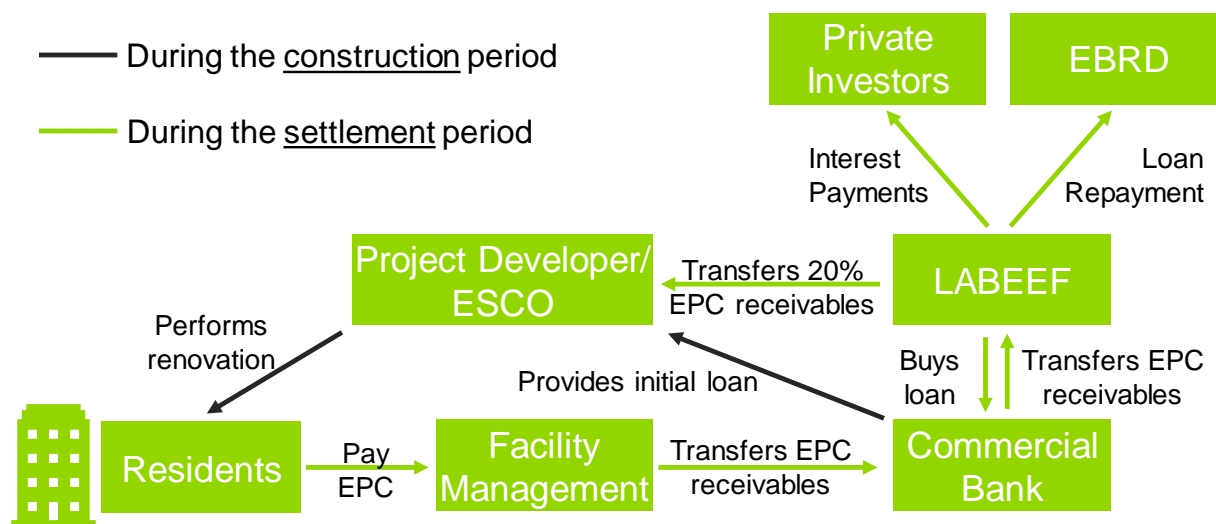
work (Jörling & Schäfer, 2018). LABEEF was originally targeting multifamily residential buildings, but the financing model is now being implemented for public buildings as well. Given the single ownership of public buildings, its implementation is likely to prove less challenging.

5.1.3 Financial mechanisms

LABEEF is a long-term financing vehicle that makes it possible for ESCOs to take up projects with a long-term repayment schedule. In other words, it separates execution of a project from the funding of the project. The European Bank of Reconstruction and Development (EBRD) provided the initial funding of €4 million in 2017 (EBRD, 2017). Initial equity was provided by F3, and additional equity is planned to be collected privately. The investments into LABEEF are used to purchase the receivables linked to the corresponding EPCs. LABEEF follows a previously approved set of investment guidelines to acquire projects for financing. The facility is a market-based instrument, which means no public money needs to be spent to achieve the envisaged CO₂ reductions (Jörling & Schäfer, 2018). However, the facility can be supported through grants and subsidies for energy audits and to cover some of the investment costs of the renovation, which could allow for a faster project uptake.

Figure 3 illustrates the financial flows during the construction and settlement periods (i.e. before and after LABEEF purchased a project). During the construction phase, the ESCO either uses its own equity or receives a loan from a commercial bank and performs the agreed renovations. After the construction phase, LABEEF buys the receivables, the ESCO repays the bank loan if it had taken one, and the settlement period begins. Residents, through collective payments by the housing association, pay their monthly EPC bill to their facility management company, which transfers the EPC receivables to its bank or directly to LABEEF. LABEEF then uses the funds to provide the 20% share to the ESCO, pay off its financiers, and to cover the costs of the facility itself.

Figure 3: Financing flows during the construction and settlement periods



ESCOs profit from LABEEF in the way that they have a professional funding structure with which they do repeat business and that takes ownership of the necessary long-term receivables. ESCOs, however, remain responsible and liable for the maintenance of the buildings and maintain the technical risk of the project. LABEEF forfeiting the loan of the commercial bank reduces the debt burden on the ESCO's balance sheet and makes it possible for the ESCO take on another loan and renovate an additional building. ESCOs can

agree to a working capital loan, which can revolve as projects are paid back and new ones are developed. In that way, LABEEF takes on some of the long-term credit risk of the project. During construction and implementation, the project risk is split between the ESCO and the lending commercial bank until LABEEF forfeits the initial loan. After LABEEF acquires the remaining project receivables, it passes on at least 20% to the ESCO and uses the remainder to pay off investors. The project risk for LABEEF is further minimised through the construction audit, which is conducted following one heating season after the construction phase is completed. This provides actual energy savings figures.

From the resident's perspective, the first and only action is required in the project development phase during the EPC negotiation. Residents need to collectively decide on the scope of the renovations to be performed, which influences the height of the monthly instalments. The EPC keeps the monthly payments constant throughout the year, removing the usual fluctuations in payments.² This means that payments in winter might be lower than usual but are correspondingly higher in summer.

The savings due to the lower energy demand are used to pay for the renovation measures. There are no additional or only a few costs for the residents. Additional costs are driven by resident wishes on other measures they would like to be implemented in the building. The annual EPC payments can be slightly higher than previous annual energy cost payments. However, the residents gain when the buildings have been deeply renovated because it not only increases their quality of life but also their property value (Stancioff, 2019). Gains through lower electricity costs only materialise after the end of the EPC.

5.1.4 Impact

Table 7 provides key performance indicators (KPIs) on the impact of LABEEF. Only a few indicators could be compiled, as the facility is still rather new and the number of already completed projects is still low.

Table 7: KPIs on the impact of LABEEF

Category	Indicator	Result
Economic	Total investments in energy efficiency (€)	€1.6 million (Stancioff, Green Buildings - Scalable Financial Instrument - Delivering a European Building Energy Efficiency Facility, 2019)
	Additional investments realised	Each loan up to 55% financed by EBRD and the remainder is private funding
	Number of projects realised (#)	Six projects are being implemented, with an additional 40 in the near-term pipeline
	Return on investment	Estimated at ~10% for private investors
	Investment per m ²	€200-€300
Technical	Average savings in final energy consumption	57%

5.1.5 Co-benefits

The main co-benefits for inhabitants are threefold. First, they enjoy an increased property

² Electricity and heating payments in Latvia vary from month to month based on actual consumption, leading to higher bills in winter than in summer.

value through the renovation measures. This increase is typically around 15%-25% of the property value (Stancioff, 2019). Second, the lifespan of the buildings is greatly increased through the renovation. Third, the quality of life is increased for the inhabitants through the newly renovated facilities and exterior, which increases their desirability from a rental perspective.

From the state perspective, the co-benefit of this privately funded transaction is lower final energy consumption and thus lower carbon emissions. LABEEF's objective is to leverage private finance funding to achieve scale and support national governments in their building renovation plans, which are part of the long-term climate policies. Additional benefits are achieved by removing health hazards presented by poorly maintained buildings and in the newly created asset class for sustainable finance investors.

5.1.6 Success factors and barriers

The main success factor of LABEEF is gaining the initial funding through EBRD that allows it to implement the EPC setup, which makes it possible to have deep energy efficiency renovation measures conducted without major additional (upfront) investment by the residents. The two main barriers are the ownership structure and the local district heating companies. The fragmented private ownership structure of the apartment buildings means that every party in the building needs to be convinced to sign the EPC. This often involves multiple meetings and building a personal relationship with residents to convince them of the merit of the EPC, which can be a time-consuming process. Another barrier is lobbying by local district heating companies, which are faced with a 50% decline in demand and hence a decline in their revenue after the renovation measures are implemented. This kind of meddling can lead to complications and unnecessarily prolong the process on a local level (Stancioff, Director Funding for Future, 2020). Table 8 lists the success factors and barriers again.

Table 8: Success factors and barriers of LABEEF

Success factor	Barrier
<ul style="list-style-type: none"> • Residents do not have to take on a loan themselves and do not incur additional costs. • Private sector funding makes the programme independent of official funds. • Separating the execution from the funding of a project allows ESCOs to take on additional projects. • Instalments in the EPC depend on actual savings and are relatively low due to the long contract duration (~20 years). • Representation through Ekoburojs, which advocates the interests of the residents and offers conflict mediation. • Verification of savings before LABEEF guarantees the financing holds the ESCO accountable. 	<ul style="list-style-type: none"> • Ownership structure can make it difficult to get all residents of a project onboard. • Local energy suppliers are not keen on the reduced energy demand and can lobby against changes. • The long EPC duration can make it more difficult to persuade owners to take part in the scheme. • Public sector finds it challenging to let private sector initiatives undertake projects at scale. • Limited understanding of the benefits of EPC.

Source: Guidehouse based on (Stancioff, Director Funding for Future, 2020)

5.2 Flemish Revolving Energy Fund – energy loans with delayed repayment for vulnerable owners

Summary

- Pilot of funding home renovation to emergency buyers.
- Funding by the Ministry of Energy, fund management by the Flemish Energy Agency, and implemented by local actors.
- Funding directly to the contractor, not to the homeowners.
- Homeowners pay back the funding when house is sold or, at maximum, after 20 years.

5.2.1 Context

In the Flemish region, the policy for energy efficiency finds its legal basis in the Energiebesluit of 19 November 2010 (Besluit van de Vlaamse Regering, 2020). This decree describes, among many other things, the grant schemes for energy efficiency, the social energy policy, and the system of energy loans, including the revolving fund. In line with the Energy Performance of Buildings Directive, a long-term renovation strategy was developed.

The Flemish region (13,522 km²) counts almost 3 million dwellings (see Table 9).

Table 9: Type of buildings

Terraced	Half open	Open	Apartments	Total
652,055	588,648	901,692	848,992	2,991,387
22%	20%	30%	28%	100%

The share of owners is 72%, and 28% of households are tenants (8% social rent).

The 2050 goal for renovation: existing residential buildings must achieve a similar level of energy performance by 2050 as new build homes with a building permit in 2015. This long-term target means that by 2050, the average energy performance of the entire housing stock will be reduced by 75%. On the Energy Performance Certificate scale with energy labels (A-F), this corresponds to the label A.

The actual renovation rate in Flanders is around 0.7%. Because less than 5% of existing houses meet the 2050 target, the annual renovation rate will have to evolve to the equivalent of more than 3% in-depth renovations (to label A). Every year between 2020 and 2050 more than 90,000 homes, on average, will have to undergo a major renovation.

The capacity in the building sector is adjusted to the actual renovation rate. However, to reach the substantially higher renovation rate needed, the capacity in the building sector needs to grow accordingly. Given the high share of older professionals and a low influx of new young people, the capacity of the market offers a big challenge for which no single measure is possible.

A scientific platform against energy poverty publishes a yearly indicator: almost 16% of

households (or 445,000) cope with energy poverty, and 210,000 vulnerable families consume electricity and gas at the reduced social tariff.

The Flanders region has a long tradition in energy grants provided by the grid operators for electricity as part of a public service obligation. This case study describes a new fund implemented in 2019, which was meant for low-income households, and discusses how this fund became operational after a successful pilot project in Ghent. The approach is based on a grant scheme, not an energy savings scheme according to Article 7 of the Energy Efficiency Directive (Directive 2012/27/EU, EED).

The region explored opportunities for a new fund because it was clear that a large share of vulnerable families did not apply for existing energy grants set aside for them. The definition of vulnerable protected consumers is defined in the energy legislation.³ An obstacle for vulnerable families applying for these grants is a general lack of prefinancing capacity to invest in renovation measures, which is a requirement to be eligible for the grant. The homeowner is obligated to pay upfront for the energy measures and will be reimbursed afterwards. The costs for these energy grant schemes are included in the tariff for electricity distribution. Vulnerable families receive a bonus on the grant amounts that varies per measure (on average 50% bonus).

The Flemish government has developed and runs two schemes for renovation and energy measures for homeowners. The first is the existing grant scheme (described above), which was completed with a 0% interest loan in 2015; the second, newer scheme was adopted in 2019 as a revolving fund for emergency buyers. This case study mainly describes the new revolving instrument implemented in 2019. However, both of these measures are part of the Flemish Energy Policy.

5.2.2 Description of the financial instrument

The main obstacle for the older energy grant is the requirement of prefinancing by the owner of the house. Therefore, in 2015, a public loan was introduced for all homeowners, with a 2% interest rate for the general public and a 0% interest rate for vulnerable people. These loans are issued by 19 Energy Houses⁴ spread throughout Flanders. As the interest rates in the private market dropped, the previous Flemish government decided to stop issuing the 2% interest loan in 2019 and focused only on supporting vulnerable families with the 0% interest loan. At the upper limit, the loan consists of €15,000 with a 10-year payback time. When people receive the grant, they can use the money for additional repayment, resulting in a shorter payback.

On top of the 0% interest loan, these vulnerable target groups can receive free technical assistance for the implementation of the renovation, in particular to:

- Determine the works to be carried out
- Assess price offerings
- Choose a contractor
- Follow up and control the works

³ Energiebesluit: article 1.1.1, 7° definition of protected consumer (= entitled to the social tariff for gas and electricity)

⁴ The region has a network of 19 Energy Houses (Energiehuis) under central coordination. The Energiehuis provides support and guidance where necessary, by answering questions (online, by phone or via a personal conversation) related to energy savings and renovation works. The Energiehuis also issues 0% interest loans for energy renovations. <https://www.mijnenergiehuis.be/>

- Assist with applications for premiums and grants

Despite this 0% interest loan, a certain segment of vulnerable owners is not able to obtain such a loan due to a lack of repayment potential—this segment is the emergency buyers. For this group, a new loan formula with delayed repayment (bullet finance) was introduced in 2019.

Emergency buyers are households that bought an inferior home out of necessity without the possibility of investing financial resources to bring the dwelling up to a good standard, resulting inevitably in high energy bills. Because these owners have insufficient resources to invest upfront in renovation measures, they cannot rely on the various grants that are only issued after the works are finished and invoices are presented. In the Flemish region, it is estimated that this is the case for 120,000 families (4% of all dwellings).

This new loan exists alongside the 0% loan described previously and is inspired by an ongoing small-scale experiment with a local revolving fund in the city of Ghent for the renovation of 10 single-family houses. The Flemish government adopted a legal basis in May 2019 to initiate a revolving energy loans fund with delayed repayment for these emergency buyers.

In the pilot in Ghent, the participating owners could rely on a financial intervention of €30,000, and they only have to pay back when the property is sold, inherited, or donated, with some of the added value on top of it (to be calculated on the basis of a formula on the difference between the value when the property was bought and when it is sold). At the end of the renovation, the pilot project was evaluated as successful, both in terms of the improved quality of living and the improved energy performance.

Based on this result, the government aims to expand this instrument to the entire territory; it created a legal basis within the energy legislation with an indefinite term for a revolving fund with a starting budget of €15.5 million and 0% interest. By doing so, the region is acting as a market facilitator by offering alternative financing not available in the market.

Local public welfare organisations⁵ will coordinate the scheme on the local level and issue the loans. The funding is provided by the Ministry of Energy, which launched a call for these institutions on 27 March 2020. The local welfare organisations can submit a project proposal for a 0% interest credit line for 4 years for a maximum of €900,000 to issue loans for emergency buyers within the municipal territory. Organisational overhead costs need to be covered by these local welfare actors through their general working means. The Flemish Energy Agency assesses the project proposals submitted by the local welfare organisations based on well-defined criteria such as quality of the project plan, selection of candidates, and the support and guidance of the owners.

On a local level, three crucial roles can be distinguished:

1. Local welfare actor as overall coordinator

The local welfare actors take the initiative and responsibility for renovation projects by searching and selecting the buildings and eligible owners and offering general guidance and follow-up. They also set up local cooperation with relevant actors.

These local welfare organisations are chosen as the main actor in this scheme because of their role as counsellor in (general) poverty issues. They have the instruments to assess the

⁵ Openbare Centra voor Maatschappelijk Welzijn is integrated in parts of the local authority.

overall situation, solvability, and payback potential. As a result, they are able to identify proactively families that could benefit from this loan. They also play a role in the follow-up. A certificate on the conformity of the dwelling with the minimal standards on health and safety and quality of the Flemish building code is obligatory.

2. Energy House

Cooperation with Energy Houses is obligatory because they manage the loans (that are registered in the same loan management system as the 0% interest loans they issue themselves).

3. Building manager

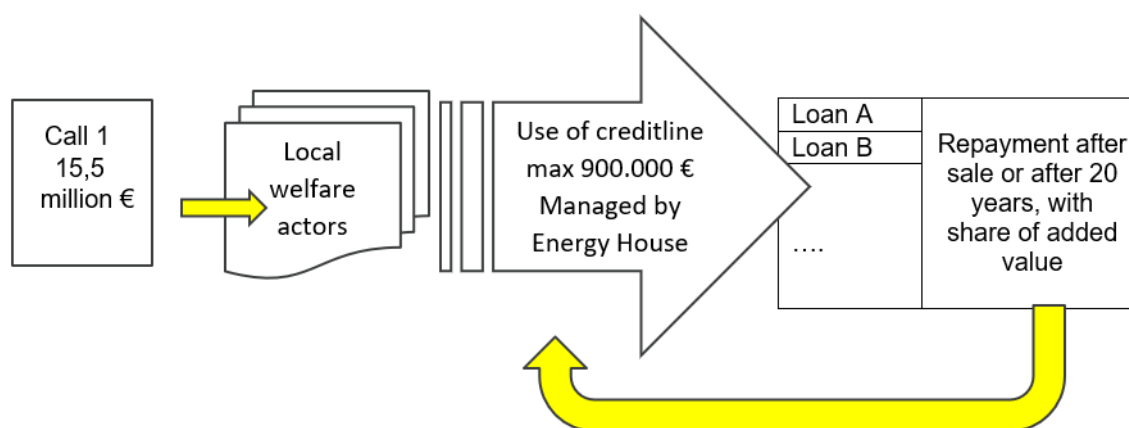
The building manager is responsible for the development, implementation, and technical management of the intended renovation work, such as the appointment of designers and contractors and the control of the implementation of the renovation. The profile requirements that a building manager must meet are described in the project call. It is important that the building is responsible for renovations and renovation guidance for or with social target groups. This building manager role could be fulfilled by the local Energy Houses, but other partners can take up this role as well. Also, technical guidance of the owner is foreseen as to make sure the inhabitants fully tap the potential of the increased energy performance of the dwelling following the improvements, including monitoring energy consumption.

The basic principle is that emergency buyers can obtain a loan of up to €25,000 to invest in energy savings measures that only needs to be paid back when the house is sold or after 20 years (at the latest). This loan can be combined with the 0% interest loan of up to €15,000 if the owner's solvency is assured. With this first budget of €15.5 million from the Flemish Climate Fund, 625 loans of €25,000 may be issued. After positive evaluation, additional funding on a regular basis must lead to substantial upscaling.

5.2.3 Financial mechanisms

Emergency buyers can apply for the loan at a local public welfare organisation. These organisations can proactively promote the scheme to their clients. Other emergency buyers can be reached through local communication campaigns (leaflets, existing means, personal, mouth-to-mouth, and the creation of a referral partnership). These buyers will only be granted a loan if the person only owns one dwelling, which must serve as their main residence according to the municipal register.

Figure 4: Financial flow



This loan of up to €25,000 can only be distributed to houses with structural problems on safety, health, and quality that need to be addressed by important renovation that:

- Result in a substantial increase in the energy performance combined with the structure.
- Conform the dwelling to the requirements on health, safety, and basic quality as outlined in the Flemish building code.
- Could not be financed with traditional loan formulas without leading to default payment according to a solvability check.

Eligible works include the following:

- Works for which a renovation grant (Housing Policy and coming from the Ministry of Housing⁶) can be issued (thus a grant and a loan can be combined)
- Works for which a 0% interest energy loan can be issued:
 - Insulation of roof, wall, or floor
 - High performant glazing
 - Airtightness, blower door test, energy audit (only in combination with other measures)
 - Ventilation system
 - Heating installation
 - Solar panels/solar boiler
 - Relighting
 - Energy efficient household appliances
 - Energy storage and management

Technical conditions for energy savings measures are in line with the 2050 goal.

To manage and administer the loans, the public welfare organisation works together with the local Energy House, which also offers the existing 0% interest loans as well as other services and guidance linked to energy measures.

The 0% interest loan is issued directly to the contractor(s) and not to the owners of the house. The contractors implement the works, and the public welfare organisation receives the money back when the owner sells the house or in the following situations.

- When the owner no longer has their main residence at the address.
- When the owner would acquire a second dwelling (even partly).
- When the house is sold.
- After a period of 20 years after the date the loan agreement is signed.

⁶ This grant can be used for a wider range than just energy measures.

On top of the amount of the loan, the owner also has to pay back a part of the added value, if there is any, which is based on a formula.⁷ The owner can repay the loan at any given time. If the owner is not able to pay back the loan after the house is sold or after a maximum of 20 years, a payment plan with a monthly payment for up to 15 years will be activated.

Risk reduction measures for the local welfare organisations are foreseen in the form of a pre-emptive right to buy the house. Also, each loan is secured by a mortgage right by the local welfare organisation.

The first call for proposals by the Minister of Energy was launched early March 2020. The call favours proposals that include a strategy for cooperation with the local network of actors on energy savings and the fight against poverty, including an obligation to work together with the local Energy House.

The idea is to scale up the fund if the pilot is successful.

5.2.4 Impact

Table 10 provides key performance indicators (KPIs) on the impact of the Flemish Revolving Energy Fund. Only a few indicators could be compiled, as – such as in the previous case – the facility is still rather new and the number of already completed projects is still low.

Table 10: Impact indicators

Category	Indicator	Result
Economic	Total investments in energy efficiency (€)	€15.5 million for the first call in 2020. Additional calls are expected.
	Private finance leverage factor (1:X) Additional investments realised	None, given that the target group has no investment capacity.
	Number of projects realised (#)	625 within the first call (expected).
	Return on investments (monetary savings from energy investments [€]/ investment costs [€])	N/A
	Investment per m ²	€165 (€25,000 for average floor surface of 150m ²)
Technical	Percentage of saved energy (saved energy [kWh]/energy used prior to the investment [kWh])	10%-20%
	Percentage of saved energy/quantity, CO ₂ , share of renewable energy consumption	N/A

5.2.5 Co-benefits

	<ul style="list-style-type: none"> • Health and comfort
---	--

⁷ Added value is the difference between 1° sales price; 2° value of the house before renovation works (estimated by expert, with inflation correction). The part of the added value is calculated as follows: $(A-B) \times (B/C)$ where A = amount of added value, B = amount of the loan, C = B + value before renovations.

	<ul style="list-style-type: none"> • Energy savings plus lower bills are beneficial for the household budget. Families with children could benefit from this, especially on the issue of increased school performance, eventually leading to a bigger chance of escaping from generational poverty (BPIE, 2018).
	<ul style="list-style-type: none"> • Value retention and growth of the house owned by the emergency buyer.
	<ul style="list-style-type: none"> • Additional action in the fight against energy poverty, including the targeted owners in the long-term renovation strategy. The target group is being addressed—not a specific geographical area with a high percentage of low-income families.
	<ul style="list-style-type: none"> • Psychological well-being.
	<ul style="list-style-type: none"> • Social justice and inclusive aspects of the climate transition.

5.2.6 Success factors and barriers

Table 11: Success factors and barriers

Success factor	Barrier
<ul style="list-style-type: none"> • An untapped market is being reached out to in order to fight energy poverty and improve housing quality and energy performance, leading to lower energy bills. The programme tackles issues on several levels. • The pilot is being set up in cooperation with the local level (Energy Houses and the local welfare organisations). These organisations know the areas and can reach the families more easily and let them participate in the programme. • Potential for upscaling when this pilot is successful. The model is easy to scale up and fits within the legislation of the Flanders region. With the rate of homes that need renovation, there is an enormous potential for the fund. • Good political and public acceptance because it covers energy poverty and low-income families. Political commitment is important, and this helps to create a leading practice, so the pilot can be scaled up when successful. • The pilot has a revolving aspect: the invested funds will return eventually, so the budget is not seen as a cost but as a long-term investment. When the first repayments are done, the funds can be reinvested. 	<ul style="list-style-type: none"> • The framework does not include financial support for the overhead cost of the local welfare actors, which could be a problem or a barrier to candidates participating in the call and be an implementing partner for this project. This will create an extra workload within these organisations without having financial assistance for that work. • The actual identification and reaching of the target group is a barrier—the local welfare organisations need to help with identifying the target groups and convincing them likely requires time and effort. When people have to go door-to-door to reach out to this group, it costs money. • The maximum amount of €25,000 is sufficient for a first step but will be insufficient in many cases to renovate the dwelling up to the 2050 standards in the long-term renovation strategy. The long-term strategy needs to be defined. • Financial risk management—the local welfare organisation can use the mortgage on the dwelling if the owner is not able to pay back the loan after the house is sold or after 20 years. When the house needs to be sold and the value is lower than the mortgage, there will be a financial gap that will need to be covered by one of the organisations.

5.3 KredEx

- The KredEx Foundation was established in 2001; in 2009, the Foundation established the KredEx Revolving Fund, which started providing energy renovation support to residential buildings in Estonia through a combination of loans, loan guarantees, and grants.
- One of the most important and comprehensive energy financing instruments offered by the fund is a reconstruction grant that went through three financing periods: 2003-2007, 2010-2014, and 2015-2020. The grant scheme went through constant improvements based on experiences from preceding financing periods, eventually reaching high impact on residential Estonian building stock.
- In the second and third financing periods (2010 and onwards), grants were linked to targeted energy performance following the higher-savings-higher-grant principle, leading to 40% average energy savings.
- Over time, the role of technical assistance (TA) and its support for renovation was constantly emphasised and strengthened. Eventually, TA started having a crucial influence on the energy savings and financial sustainability of the investments realised through the grant scheme.
- The customer journey has been constantly improved with strong involvement of local banks, TA experts, and contractors. The purpose of these improvements was to make the application process easier and to reduce risks perceived by project participants. A significant part of the journey was raising awareness, which helped housing associations (HOAs) decide their renovation intentions and enter the financing process.
- Proven impacts of the grant schemes were twofold: direct impacts brought average savings of 75 GWh and 15,000 tons of CO₂ per year, while indirect impacts included significant tax returns to the national budget, increased employment, and improved indoor conditions in residential buildings.

5.3.1 Context

Brief analysis of the Estonian building stock shows the country has around 581,000 buildings, covering around 131 million m² of useful floor area. Residential buildings represent 35% of all buildings and use 44% of the built floor area. Furthermore, multifamily and single-family buildings comprise 60% and 40% of the residential building stock, respectively. Regarding the building age, the majority of the building stock was built before 2003, and is more than 15 years old.

On average, the Estonian housing stock demonstrates around 136-150 kWh/m²/year of heating energy consumption for apartment buildings; domestic hot water requires additional 27-39 kWh/m²/year, and electricity around 35 kWh/m²/year. Low energy efficiency levels are only one of the problems in existing apartment buildings. Other problems include insufficient ventilation and thermal comfort levels.

Energy-saving policy in Estonia is defined through the Estonian Energy Sector 2030 Development Plan, which covers energy consumption in buildings and sets relevant energy consumption targets. For this purpose, the Estonian government put in place a system of financial support schemes through KredEx, one of the most important renovation support programmes in the residential sector. Despite the recent success of the KredEx program,

according to the Estonian Real Estate Association, another 14,000 buildings in Estonia require renovation, where national financial support will be an essential component.

The Estonian construction industry recovered from the financial crisis of 2008/2009, with an annual increase in building permits of around 20% between 2010 and 2016. Although the number of job vacancies in the construction sector experienced a significant increase, the total number of workers is still much lower than it was before the 2008 crisis. Furthermore, business confidence in the construction sector has been in flux and affected financing opportunities, resulting in a decrease in lending to the construction industry at a rate of approximately 2% per annum.

Interest rates on housing loans have been decreasing constantly from 3% in 2010 to 1.7% in 2016, but this resulted in stricter lending standards. The majority of the Estonian building stock is owner-occupied, with 81.5% owners and 18.5% tenants—mostly due to policy favouring home ownership over tenancy. However, recent trends have gone towards housing rentals, with an increasing share of tenants (European Commission, 2018).

Various studies showed that to realise the full energy savings potential, support schemes are necessary in Estonia, especially in residential buildings. In addition, setting up the correct renovation requirements is crucial for any support scheme because typical/ compulsory renovation standards can lead to a slower rate of renovation, mostly due to potential mismatches between policy, the nature of existing residential buildings, and the financial preferences of homeowners.

5.3.2 Description of the KredEx Fund and its main instruments

The KredEx Foundation was established in 2001 by the Ministry of Economic Affairs and Communications. In 2009, the KredEx Foundation's energy efficiency investing switched from a grant-only scheme to support combining loans, loan guarantees, and grants. To support this switch, the Foundation initiated a revolving energy efficiency fund named the KredEx Revolving Fund. This fund continues to be active and has grown in size and impact since its initiation.

The fund's objective is to incentivise apartment building owners to reduce energy consumption, increase the energy efficiency of their homes, and use renewable energy by providing access to preferential loans and grants under certain conditions.

The Foundation and the fund were established at the country level. The fund is managed by the central government, taking the responsibility and covering relevant markets at the country level.

Role of actors involved

Management structure (of the KredEx Foundation and the Revolving Fund)

Management is headed by the Minister of Entrepreneurship and Information Technology who exercises the rights of a founder and can appoint and remove the Supervisory Board members.

The Supervisory Board has up to seven members in charge of planning the KredEx Foundation's operations, organising its management, and carrying out supervision of its activities. The management structure also includes the Management Board, which executes and puts into practice all the decisions made at higher management levels. The management structure is further supported by an internal auditor, finance committee, and different departments dealing with risk management, financial issues, and various Foundation business lines, including the Housing and Energy Efficiency divisions.

The Foundation acts as the fund manager of the dedicated KredEx Revolving Fund and serves as marketer, assessor, and financier of the fund. In parallel, it coordinates how the Fund functions and operates in accordance with the fund-related requirements of the Ministry of Economic Affairs and Communications.

Investors

The KredEx Revolving Fund is financed through various grant programs and loans. Initial funding of around €49 million was provided from three main sources: a €29 million loan from the Council of Europe Development Bank (CEB), a €17 million grant from the European Regional Development Fund (ERDF), and €3 million from the KredEx Foundation. Subsequent investments into the fund included debt provided by the Estonian government (State Treasury and Ministry of Finance).

Intermediaries

Throughout its life, the fund has collaborated with different intermediary and other financial institutions. Throughout the KredEx programme implementation, the capital flow included supplying intermediary financial institutions with loan guarantees and preferential funding, while the financial institutions provided loans to housing associations. In turn, the financial institutions supplied end users with either loans or loan guarantees. However, recent focus is on providing financial institutions mostly with loan guarantees.

The fund started its collaboration with financial institutions through Swedbank and SEB and expanded its list over time to include Swedbank, Citadele Bank, Danske Bank, Coop Bank, Luminor, SEB Bank, and Tallinna Äripank, to name a few. Roles of the intermediary banks also include taking investment decisions regarding building investment projects and handling most of the required administrative formalities of the loan application process.

Housing associations

HOAs have a strong role in the Estonian residential sector and among apartment owners. In addition, the residential sector is homogenous, which goes hand-in-hand with the role of HOAs and supports their role in initiating project ideas and making different decisions. For instance, a turning point for renovating residential buildings in Estonia took place when the legislation reduced the required share of positive votes needed for a positive final decision within an HOA from two-thirds to a 50% plus 1 vote. This reduction proved itself powerful in achieving an increase in the residential renovation rate.

Clarification

Given the important role an ESCO market can have in renovating buildings, we should note that the ESCOs in Estonia do not invest in residential buildings due to long investment payback periods. From the ESCOs' point of view, the typical residential payback period of 15 years is beyond the acceptable limit, and that is why ESCOs are usually focused on the non-residential sector where payback periods are shorter.

5.3.2.1 Solutions provided by the KredEx Foundation and the KredEx Revolving Fund

The KredEx Foundation offers different financial solutions to legal and private entities. The fund's two main business lines are related to financing housing and energy efficiency of buildings and financing different enterprises and businesses. The following are the offered energy efficiency financial instruments:

Guarantees and loans in housing and building energy efficiency

One of the most important activities of the KredEx Foundation is issuing loan guarantees that enable the purchase of a home at a lower rate of self-financing and ensure the preservation and energy efficiency of residential buildings.

Reconstruction grants

Reconstruction grants have been designed for residential buildings and apply either to apartment associations or local governments. These grants target complete reconstruction of residential buildings and have been recently provided with the rates of 15%, 25%, and 40% of eligible costs.

Grants for small residential buildings

In 2018, KredEx started issuing two types of grants for small residential buildings. One was designed to update oil-powered heating systems and the other to renovate housing.

Home grant for families with many children

KredEx also allocates grants to large families to improve their residential living conditions. Among other investments, these grants include renovation of homes and construction, replacement, or updating of the associated technical systems and utilities.

Among the listed instruments, the reconstruction grant is the most important and comprehensive instrument; therefore, it is presented and analysed in the remaining part of this report.

5.3.3 Main characteristics of KredEx renovation grant scheme**5.3.3.1 Purpose and general information**

KredEx renovation grants are aimed at the all-inclusive and wide-ranging renovation of an apartment building. Direct benefits of the renovation grants are not only focused on the energy performance of the building but also the extension of its lifetime, increase in its value, and better living conditions within the building.

Apart from few other purposes, the main objectives of the renovation grants are energy efficient apartment buildings achieving better indoor climate, promoting the use of renewable energy sources, reduced energy costs for households, and reduced energy dependency and greenhouse gas (GHG) emissions. To measure achieved impacts, the fund established the following indicators: a) number of apartments with improved energy efficiency class; b) size (indicated by floor area) of reconstructed buildings; and c) estimated annual CO₂ reduction.

The most important grants scheme stages are the 2003-2007, 2010-2014, and 2015-2020 periods. This overview reflects on the different grant scheme characteristics and how these changed over time, while focusing on the most recent characteristics and results.

5.3.3.2 Eligible measures and costs

Renovation grants are targeting apartment buildings built and put into use before 1993. These grants can be disbursed to either apartment associations or local governments or cities when they have ownership over the entire building that should be renovated.

The following energy efficiency measures, when applied to an apartment building, are eligible for renovation grants:

- Building envelope measures including reconstruction and insulation of façade, balconies, roof, and basement, as well as replacement or renovation of windows and doors.
- HVAC system measures including replacement, reconstruction and balancing of the heating system, construction of a heat recovery ventilation system, reconstruction of

the ventilation system, and acquisition and installation of equipment necessary for using local renewable energy.

- Electrical system measures including replacement or reconstruction of the system serving common areas.
- Preparation of the design documentation and building audit, site investigation, and use of consulting services for this purpose, together with supervision of the works.

However, not all costs related to these measures are eligible to be covered by the renovation grants. In general, eligible costs are all those costs necessary for achieving the success indicators.

5.3.3.3 Support levels and required project results

The maximum share of the eligible costs covered with grant changed through the different grant schemes but remained between 15% and 40% of eligible costs. In addition to the level of energy savings, the most important criteria defining the grant level are building location and building value. On top of this, grants will cover 50% of the costs associated with engineering design, supervision of construction works, and other types of technical consultancies.

To be eligible for a renovation grant, a project must be able to fulfil different conditions linked to the energy performance of buildings (including performance of different building and HVAC system components). As a rule, granted shares increase by achieving a higher energy performance certificate (achieving Energy Performance Certificate class E brings 15% of the grant and class C brings 40%). Class C is the class also required for construction of new buildings).

In the first grant scheme (2003-2007), grants equalled 10%, increasing to the 15%-35% range in the second scheme (2010-2014). During the last grant scheme (2015-2020), the upper limit of the grant share increased to 40%.

5.3.3.4 Role of technical assistance

Any individual or legal entity performing design and construction works shall prove their competence to be involved in work financed through the renovation grants. Competence is proven through a certificate of professional competence based on relevant local professional standards.

The role of the TA is extremely important for the KredEx renovation grant scheme because the success of the programme strongly depends on well-prepared building design documents and accurate energy efficiency calculations; these require significant expertise from the side of the TA consultants.

Another role of the TA is linked to the execution of the construction works that must be supervised and their quality confirmed by experienced supervisors, ensuring a satisfactory level of energy savings. In addition, strong measurement protocols for ventilation and heating system performance are implemented, and the energy label is confirmed through collecting and analysing 1 year of energy data following measure implementation.

Technical assistance is financed by the fund, which further supports KredEx's role in projects approved for grant support by ensuring the high quality of TA services provided. The fund finances 50% of the technical assistance costs related to project design, different technical advisors, and preparatory works. By financing the TA, KredEx can select reliable and proven

TA providers, which may not happen when the TA is selected and paid for by the end user who can, although with best intention, opt for a cheaper and a low-quality TA supplier.

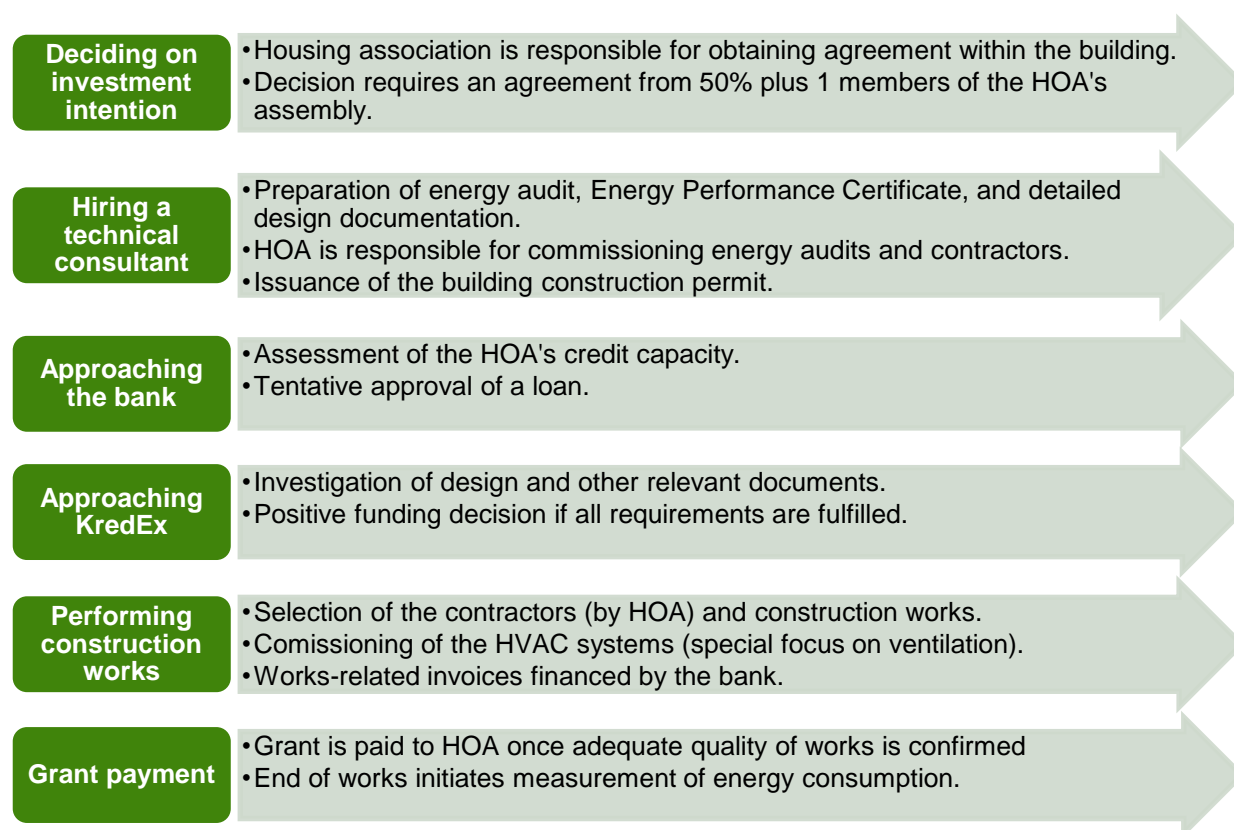
A list of different TA providers is available from the KredEx website. However, other relevant sources are databases of experts managed by different Estonian authorities, which are responsible for their respective areas of expertise. For instance, a list of certified energy auditors is managed by the relevant Estonian authority and kept publicly available.

5.3.3.5 Customer journey

To apply for the renovation grant, an applicant should go through different steps and submit different application documents to different project participants. Among other purposes, these documents would explain the nature of the intended measures, targeted results, technical assistance, and quality of performed works.

Details of the customer journey may be found in Figure 5.

Figure 5: Customer Journey



The HOA applies for a loan that is, following its approval, disbursed directly to the contractor. In parallel, the HOA applies for a grant that is first paid to the HOA and then from the HOA transferred to the contractor.

5.3.4 Impact

Results presented in Table 12 refer mostly to the 2009-2014 renovation grant scheme, while some of the preliminary or forecast results for the 2015-2020 period have been shown as well.

Table 12: Impact indicators

Category	Indicator	Result
Economic	Total investments in energy efficiency (€)	€38 million of grants approved, resulting in total investment of €150 million
		€112 million of private investments, including loans and owner contributions. Amount provided through loans is €72 million.
	Private finance leverage factor (1:X)	€1 of grants initiated €2.9 of loans and owner contributions (total private investments). Private finance leverage factor equals 1:2.9
	Additional investments realised	Distribution of grant contributions (661 buildings): <ul style="list-style-type: none"> • 275 buildings – 15% grant • 181 buildings – 35% grant • 205 buildings – 25% grant
	Number of projects realised (#)	661 buildings with 24,000 apartments and 1.7 million m ² of floor area
	Return on investments (monetary savings from energy investments [€]/ investment costs [€])	N/A
Technical	Average investment per m ²	2015-2020 (before December 2016): €250/m ² of total investments, grant covering €100/m ²
	Percentage of saved energy (saved energy [kWh]/energy used prior to the investment [kWh])	On average, 40% of energy saved
	Percentage of saved energy/quantity, CO ₂ , share of renewable energy consumption	75 GWh and 15,000 tons of CO ₂ saved per year

5.3.5 Co-benefits

Different studies examined and confirmed different wider renovation benefits. Provision of grants, as shown by the KredEx example, support the investment decision and mobilise private investments, increasing both the level of economic benefits and the number of potential beneficiaries.

Main co-benefits confirmed in case of KredEx grant schemes are as follows:

- Tax return to the government budget equalling 32% of total renovation costs. The biggest position of the tax return originates from the increase in construction activities (28% out of 32% of direct tax returns come from this source) and is executed either through value-added tax (VAT) or labour taxes.
- Each €1 million of renovation costs results in around 18 new jobs generated per year.
- In each year, the Estonian government budget saved €186 million by reducing expenses that would otherwise have to be used to cover different costs associated with improper indoor air quality. Different research confirmed that around 4,900 disability-adjusted life year (DALY) has been saved each year, where DALY is a metric representing the loss of the equivalent of 1 year of full health.

Although wider benefits are well-documented, for this report, it was not possible to understand to which extent these definitely positive effects are taken into account by public authorities when making their decisions about investing in KredEx.

5.3.6 Success factors and barriers

Existing and past barriers, how they were resolved, and dominant success factors are explained through the evolution of the grant scheme through the different stages: 2003-2007, 2010-2014, and 2015-2020. This approach supplies various explanations of potential barriers and how (if so) these were resolved over time. In this sense, analysis of the KredEx renovation grant schemes may offer important conclusions about how similar programs could be planned for in the future.

Table 13 provides a structured presentation of the barriers and success factors.

Table 13: Success factors and barriers

Barrier	Success factor
<ul style="list-style-type: none"> Lack of loans with attractive conditions that would accompany grant funding, as noticed in the 2003-2007 grant scheme. 	<ul style="list-style-type: none"> Within the succeeding grant schemes (2010-2014 and 2015-2020), KredEx started increasing the share of provided grants and offering a combination of different instruments—grants, loans, and loan guarantees—to different project participants (end users and banks), therefore supporting a much more efficient financing mechanism.
<ul style="list-style-type: none"> Low level of planned energy retrofits and achieved energy savings rates, as noticed in the 2003-2007 grant scheme. 	<ul style="list-style-type: none"> To overcome this barrier, KredEx introduced higher energy savings required for the grant support. At the same time, the level of grant support was linked to achieved energy savings, providing strong incentive for deeper renovation. Another approach to overcoming low energy savings is focusing on an obligatory energy audit and renovation that must follow its recommendations. At the same time, high quality supervision of the construction works is obligatory. More recent actions to support the solution to this barrier include streamlining the requirements for high quality design documents, measurement of energy system performance, measured energy label, and well-planned maintenance after the renovation.
<ul style="list-style-type: none"> Low awareness among project participants and lack of willingness to take long-term commitments. 	<ul style="list-style-type: none"> Holistic approach to the grant scheme was applied, including raising awareness through TV campaigns, different technical studies, and promotion of leading practice projects, to name a few. These activities were conducted by KredEx through promotion of both building renovation and the renovation loans. Co-benefits of energy renovation were investigated and documented through different studies, proving a win-win situation for project participants.
<ul style="list-style-type: none"> Decisions of end beneficiaries are sensitive to changes in economic situation in the country. 	<ul style="list-style-type: none"> Although not a result of KredEx activities, the improved economic situation in the country, mostly reflected through stronger private banks and lower interest rates, provided significant support to financing the energy renovation activities.
<ul style="list-style-type: none"> Low cost-effectiveness of the investments. 	<ul style="list-style-type: none"> Careful design of grants helped fight this barrier. As an example, 40% of grants are enough to keep monthly payments after the renovation (energy expenses and servicing of the private financing sources) at the same level as before the renovation (energy expenses only), but they bring improved indoor conditions and increased real estate value.

5.4 JESSICA 2

Summary

- Lean and mean loan scheme for renovation measures.
- Bank Gospodarstwa Krajowego (BGK) serves as a one-stop shop.
- Total loan instrument of €40 million for apartments and public buildings.
- Minimum energy savings of 25%; further discount on interest rate by higher energy savings.
- Strong assessment upfront by certified persons on the project and at BGK.

5.4.1 Context

This case study describes the financial instrument on Joint European Support for Sustainable Investments in City Areas (JESSICA) 2 in the region of Wielkopolska, Poland. Wielkopolska is one of 16 regions (Voivodeship) in Poland. It is the second largest region and is inhabited by 3.495 million people (Poland's total is 38.6 million people per 1 January 2020 (<https://countrymeters.info/en/Poland>)).

Poland's residential building stock (data 2011) consists of 5.5 million buildings (BPIE 2018), of which 46% is single-family housing and 54% is multifamily housing (BPIE, 2015). Multifamily housing accounts for around 38% of the built residential square metres (BPIE, 2016). Most dwellings were built between 1971 and 1978. Of the total number of dwellings, about 82% is owned and 18% is rented (Eurostat, 2017).

The average energy consumption per capita in Poland is 3,934 kWh. In 2015, renewable energies accounted for around 11.9% of actual total consumption (Worlddata). Polish energy consumption in households by energy carrier differs significantly from other EU countries; notably, the country has the highest per capita coal consumption. The consumption of coal per inhabitant in Poland was 10 times higher than the EU27 average.

Energy consumption per m² in households with climatic correction was decreasing, on average, by 1.8% per year in 2000 to 2015. After being quite stable until 2006, the energy consumption per m² has decreased by around 2.6% per year from 2006 to 2015. Energy consumption for water heating reaches 0.2 toe per dwelling (16% of total consumption), 0.1 toe/dwelling for cooking (8.3%), and 0.13 toe/dwelling for electrical appliances (10.0%). Consumption for water heating and cooking have been stable over the years, while consumption of electrical appliances grew by 1.3% per year (Odyssee MRE/Enerdata).

Poland has several financial schemes supporting energy efficiency on national and regional levels; some are described in a Buildings Performance Institute Europe (BPIE) study from 2016 (BPIE, 2016).

The instrument described in this case study provides loans and was set up under a framework similar to the first JESSICA initiative, when the first urban development funds (UDFs) were operating. The first UDF in Poland was set up in 2010, under the ERDF regulatory period, 2007-2013. Within this period, six UDFs were set up, of which three are managed by BGK. The focus of these funds in Wielkopolska was urban regeneration and supporting innovation and environment institutions. In 2014, the new ERDF regulatory framework was implemented covering 2014-2020. In this period, BGK acted in four regions as the implementing entity or the financial intermediary. In Wielkopolska, BGK implemented

financial instruments focused on two areas: regeneration of urban areas and energy efficiency of buildings. This case study focuses on the loans regarding energy efficiency measures taken in multi-apartment buildings. In these apartment blocks, 100% are privately owned.

BGK is the only state development bank in Poland and is 100% state-owned. BGK is an active partner in the implementation of EU programmes at the local and regional levels. It is implementing 19 operational programmes (16 regional, three national) and managing those EU funds.

Experience from the previous implementing programme has resulted in this new loan instrument, it should be set up lean and mean. A simple structure, which takes less time to set up and cost less for the beneficiary and the end user. The rules what is eligible are hereby also less complex.

5.4.2 Description of the financial instrument

The JESSICA 2 loan instrument for energy efficiency in Wielkopolska was launched in 2017 by BGK, and €40 million has been evenly allocated to support both multi-apartment buildings and public buildings.

This financial instrument dedicated to multi-apartment buildings is financed from the Regional Operational Programme (ROP) of the Wielkopolskie Voivodeship for 2014-2020 in the amount of €29 million. The contribution is coming from the ESIF for approximately 90% and from the Polish State budget resources (up to 10% of total resources).

BGK acts as the implementing entity based on the agreement concluded with the board of the Wielkopolskie Voivodeship. BGK is entitled to a management fee—the fee payable for the functions exercised. This fee is based on a combination of a fee for the total fund under management and a fee for the disbursed funds into projects.

In 2017, BGK opened the call for applications. As of February 2020, the value of received applications was higher than value of funds available. Parties that have applied for funding are spread throughout the region; there is no focus from a specific town or city. The fund is still open for applications, and the disbursement of loans is possible until February 2023. In principle, the loans will be granted to the institution that applies first, but with some revolving funds coming in as well, they still accept applications and can see which one fits in the actual budget. There is a wide range of eligible parties that can apply for the loan (see Annex 1 in Section 5.4.6.1), but the main group of applicants are municipalities (in the case they own social housing blocks), HOAs, and housing cooperatives. The total number of projects is not yet clear because new applications and projects are being evaluated continuously. To be able to apply for a loan, an energy audit needs to be available. The energy audit needs to be prepared by an authorised person or company, and BGK has an authorised person to double check it. This also counts for the supervision. The project does not require an ex post energy audit, but it requires a declaration signed by the company that prepared the project and building plans that everything was done according to plan and the energy audit.

Most effort is done at the beginning of the process and during the construction period. When there is suspicion that works have not been implemented correctly, a second opinion will be carried out.

Eligible measures (shallow or deep renovation)

The aim of the fund is to finance measures that increase the energy efficiency of the housing sector. The types of measures eligible for funding are comprehensive and deep energy

modernisation of multi-apartment buildings and public buildings as well as installation of energy-saving installations. Examples of eligible interventions are connecting buildings to the (district) heating network, renewable energy systems installations (but only as part of energy modernisation of buildings, never as the sole implementation), and conducting energy audits and supervision services. A more detailed list can be found in Annex 2 (Section 5.4.6.2).

The mandatory condition for each applicant is the need to demonstrate a minimum of 25% energy efficiency for each building, confirmed by the requested energy audit at the time of the application.

Exclusions

Projects that are physically already completed or fully implemented are not eligible. The project does not need to be included in the Low Emission Economy Plan of municipalities (PGN, plans adopted by municipalities but that are not mandatory). Projects already included in a PGN are additionally rewarded (additional reduction of loan interest). Projects that already have renewable energy system installations are also additionally rewarded (additional reduction of loan interest).

5.4.3 Financial mechanisms

Perspective: customer journey

The BGK serves as a one-stop shop, which means the whole application process is carried out in one institution (BGK), and a loan is being disbursed by BGK to the applicant. The applicant will invest in energy measures, and the tenants of the apartments pay a monthly fee included in service costs to the entity managing the estate on behalf of the inhabitants. This entity can be the housing association—e.g. the decision to renovate the apartment blocks is made within the structure of the homeowner associations. There needs to be a majority voting in favour of renovation, which would result in an increase in service costs. Within this structure, BGK will decide on the measures taken and the increase of service costs. Depending on the size of the building (number of apartments in the building), the percentage that needs to be in favour varies. There is no national law on taking these decisions, but there is on the voting procedures within the homeowner associations.

BGK has set up campaigns in 10 different cities in the region for the sale and promotion of the instrument. The local branches of BGK have organised these seminars in its own city. Homeowner associations, auditors, and construction companies were invited to reach the right target groups.

Description of financing mechanism

- The fund can give out loans; preferential loans are granted both in aid schemes (following regulations on state aid and de minimis aid) and non-aid schemes.
- The loan amount ranges from PLN 100,000 up to PLN 10 million (~€22.900 to €2.229.000⁸).
- The maturity of the loan is up to 20 years.
- The interest rate is below the market rates for commercial loans.
- The fixed interest rate ranges from 0.15% to 0.50%; the higher the level of energy

⁸ Exchange rate based on the rate on 15 March 2020.

savings, the lower the interest rate on the loan:

- Energy savings of 25%-40% – interest rate 0.5% p.a.
 - Energy savings of 40%-60% – interest rate 0.25% p.a.
 - Energy savings of over 60% – interest rate 0.15% p.a.
 - Additional 20% interest rate reduction for projects included in PGN or involving renewable energy sources (the total interest rate cannot be lower than 0.12% p.a.).
- There is a grace period up to 15 months from the date the loan was first disbursed and can be extended to 20 months.
 - Loan share in investment: up to 85% of total eligible investment costs (depends on state aid issues); permissible exceptions: up to 100% of total eligible costs for small investments (up to 750,000 PLN) in non-aid scheme.
 - Collateral: in the case of municipalities – promissory note;⁹ in the case of cooperatives and housing associations – assignment of rent; other entities – mortgage or other collateral.
 - Gross expenditure is financed (i.e. including VAT if the investor has no legal means of recovering the tax).
 - No additional fees or commissions are charged to the final beneficiary.
 - The application process to receive a loan is as follows:
 1. Investors apply at BGK for a loan based on an energy audit (done for every multi-apartment building).
 2. BGK assesses the loan application based on criteria (eligibility, cash flow, risks).
 3. In the case of a positive application, the applicant (final recipient) signs a loan agreement with BGK and construction contracts with its contractors.
 4. Before the first actual disbursement, a service purchase contract (between applicant and the contractor) needs to be submitted to BGK.
 5. Money from the loan is disbursed on the recipient's request based on the invoices afterwards (in the case of municipalities, it can be done in advance based on the building's contract).

After project completion, the final settlement of investment is processed. It is checked if:

- The entire loan amount has been spent on eligible costs and transferred to contractors.
- The required level of energy efficiency has been obtained, which means at least 25% energy savings (which should be part of the energy audit being approved by an authorised auditor of the bank).

The assessment of the projects and stages of granting the loan to the final beneficiary consists of the following steps:

⁹ A promissory note is a financial instrument that contains a written promise by one party (the note's issuer or maker) to pay another party (the note's payee) a definite sum of money, either on demand or at a specified future date.

- Compliance with ROP: Type of applicant, type of building, scope of project, verification of energy audits (minimum energy efficiency, scope of work)
- Legal: State aid rules, environmental assessment
- Technical: Timetable and estimated costs of the project
- Financial: Assessment according to the Banking Law and internal procedures (credibility, cash flow, etc.)
- Collaterals: Value and quality

The general tasks and the marketing and promotional activities (see Annex 3 in Section 5.4.6.3) are paid from the management fee. Additional funding (e.g. ELENA¹⁰ funding) might become available in the future. The developed energy audits as eligible costs may be financed from loan payments. At this stage the funding is a combination of ESIF funding and state budget.

5.4.4 Impact

Table 14: Impact indicators

Category	Indicator	Result*
Economic	Total investments in energy efficiency (€) – JESSICA 2 loans	21.6 Million**
	Private finance leverage factor (1:X)	N/A
	Additional investments realised (€):	5.8 Million
	• Investors' own contribution	2.7 Million
	• Additional funding from BGK or another bank	
	Number of projects realised (loan agreements) (#)	37
	Return on investments (monetary savings from energy investments [€]/ investment costs [€])	N/A
	Number of buildings	253
Technical	Number of upgraded households (# of flats)	7,153
	Investment per m ²	N/A
	Saved primary energy consumption (kWh/year)	39,125,064
	Reduced CO ₂ emissions (MgCO ₂ /year)	6,657
	Percentage of saved energy (for this case study, calculated as weighted average per flat)	31.9%


* Result based on agreements concluded.

** Value of the loan agreements concluded so far (including Q1 2020).

5.4.5 Co-benefits

¹⁰ ELENA is a joint initiative by the European Investment Bank (EIB) and the European Commission under the Horizon 2020 programme. ELENA provides grants for technical assistance focused on the implementation of energy efficiency, distributed renewable energy, and urban transport programmes.

The co-benefits generated are listed in the following table:

	<ul style="list-style-type: none"> • Improved buildings—additional investments in buildings not related to energy efficiency (ineligible costs, by-the-way investments) • Improved living standards and health conditions. This also means that funds can be spent on other needs by the people. As energy bills will be lower, it results in a behaviour change by the owners.
	<ul style="list-style-type: none"> • Improved image of towns and cities and external appearance of the buildings.
	<ul style="list-style-type: none"> • Increased awareness of the neighbours and willingness to apply for a financial instrument.
	<ul style="list-style-type: none"> • Low operation costs of the instrument (only management fee payable to the bank) result in higher amount allocated in loans.
	<ul style="list-style-type: none"> • Vulnerable consumers are not a specific target group of this instrument, but when they are in a building that will be renovated, they will automatically benefit. Rents are maximised by the municipality. When vulnerable families own an apartment, they influence the homeowner association process.

5.4.6 Success factors and barriers

Table 15: Success factors and barriers

Success factor	Barrier
<p>Instrument:</p> <ul style="list-style-type: none"> To reach a bigger audience and more projects and thus more houses renovated, the loan system is kept simple. This results in low cost loans for investors and a simple application procedure/documentation. The interest rate should be close to 0%, and no additional fees and commission should be required. This results in overall costs being significantly below the market costs of a loan. Support is provided for investors at every stage by BGK, which serves a one-stop shop. This is contrary to the grant allocation process; in this case, the investor may consult BGK for projects at any stage. The loan can only be granted with a minimum energy savings of 25%—the higher the energy savings, the lower the interest rate, which provides an additional incentive. Energy audits and supervision services are obligatory (quality plus real savings) and eligible. This makes the quality better and is arranged upfront. The management fee is partly performance-based, which gives a good incentive to BGK to perform. <p>Investor:</p> <ul style="list-style-type: none"> The dedicated property manager and determined management board plays a key role in the process as a project leader. They need to convince the minimum required number of inhabitants, fill out the application process, and find contractors. To have all this in one hand seems efficient. Proper assessment of modernisation works is done by the investor, and there is a good control mechanism with the BGK application structure and in the monitoring structure. This is more work upfront but helps to achieve a qualitatively good project. 	<p>Market:</p> <ul style="list-style-type: none"> The main market barrier is receiving information about new forms of support and expectations regarding other form of support (i.e. new subsidies programmes). It might distort the mechanism of the existing instruments. <p>Investor:</p> <ul style="list-style-type: none"> A barrier can be to receive the consent of the majority of the owners within the apartment building. It takes time and effort to communicate with the owners. A loan will not be granted if the investor already has significant bank debts or there is a high rate of unpaid rent.

5.4.6.1 Annex 1

Eligible entities and final recipients

Entities eligible to receive a loan from the fund are:

- Municipalities and their associations
- Subsidiaries of municipalities that are a legal entity (including municipal companies carrying out the municipality's own tasks)
- NGOs (applies to entities that are a legal entity)
- Cooperatives and housing associations
- Social housing societies
- Legal entities of churches and religious associations

- Private Public Partnership participants implementing hybrid projects for a public partner
- (Legal) entities that are energy service providers within the meaning of Directive 2012/27 / EU (i.e. ESCOs)
- Entities from outside the public sector conducting business activities in public buildings
- State legal entities, including their subsidiaries
- Universities

5.4.6.2 Annex 2

Eligible measures:

- Modernisation of heating, energy, water, and sewage infrastructure
- Connecting buildings to the (district) heating network
- Insulation of buildings
- Replacement of external woodwork
- Renewable energy systems installations (but only as a part of energy modernisation of a building, never as the only upgrade)
- Cogeneration
- Conducting an energy audit
- Supervision services
- Purchase of intangible assets
- Conducting an environmental impact assessment

5.4.6.3 Annex 3

The tasks of the implementing entity, BGK, include the following:

- Marketing and promotion of the financial instrument
- Identification of viable or eligible projects
- Assessment of loan applications
- Structuring the funds (loan, investors' own contribution, other sources)
- Negotiations with investors
- Concluding loan agreements and collaterals with final recipients
- Disbursements of loan instalments
- Monitoring and control of projects
- Securing of co-financing of projects
- Repayment of recovered debts

The marketing and promotional activities consist of the following:

- Brand logotype
- Information on websites
- Media campaigns (radio, press, internet) promoting loans, targeted at potential applicants and the public
- Publication of sponsored articles
- Organisation of conferences and workshops, dedicated to specific groups of recipients
- Organisation of meetings for potential applicants
- Production and distribution of advertising and information materials
- Participation in thematically related events (mainly at regional and national level)

5.5 New Green Savings Programme

Summary

- Funded mainly through the proceeds of unused EU Emissions Trading System (ETS) certificates.
- The amount of the funding depends on the calculated energy savings before and after the implementation.
- Licensed specialists provide advice and guarantee quality.
- Projects are prefinanced; grants are only disbursed after an ex post evaluation.

5.5.1 Context

The Czech housing stock is often crumbling, old, and energy inefficient. The residential building sector consists of roughly 4.1 million occupied dwellings, with around 2.3 million (57%) multifamily houses or apartment buildings and 1.7 million (43%) single-family houses (MRD, 2019). Around 1.2 million apartments are prefabricated Soviet-era high-rise apartment buildings, which were mostly built during the 1960s and 1970s (Zahradnik, Karásek, & Zuzana, 2012). Around 68% of dwellings are occupied by their owners, while only 19% are rented; the remainder is often hybrid type or rented by people close to the owner (Plecáková & Seidler, 2019). The baseline renovation rate is around 1% per year (MIT, 2017). The energy-related renovation rate as a percentage of the stock in the residential sector was 13.7% between 2012 and 2016 (Ipsos; Navigant, 2019). The majority of these renovations (6.7%) were below 3% savings in primary energy consumption or showed only light savings (5.2%)—i.e. below 3%-30% reduction in primary energy consumption through the renovation. The renovation rate for medium energy efficiency measures with savings between 30% and 60% was just 1.6%, and for deep renovation measures with above 60% savings, the rate was just 0.1% (Ipsos; Navigant, 2019). Households are responsible for around 30% of the final energy consumption in 2017 (Eurostat, 2019). Most of this energy is used for heating purposes.

The Czech Republic's State Energy Policy (SEP) was signed into law in May 2015, and is complemented by various national laws and the National Energy Efficiency Action Plan (NEEAP). The various policies set out sectoral and an indicative energy efficiency targets of 1,060 PJ of final energy consumption in 2020. The Czech Republic also set out a long-term

renovation strategy for the building sector. The strategy was implemented in 2014 and updated in 2017 (MIT, 2017).

The NGS Programme, which is designed to support energy efficiency renovations, is not the only programme that exists with this goal. Three additional programs exist for the residential sector alone: the Integrated Regional Operational Programme (IROP, 2014-2020), the Operational Programme Environment (OPE, 2014-2020), and the PANEL Programme (2013-2020). IROP targets public and apartment buildings and aims to improve the thermal performance of building; as such, it has an overlap with NGS. The budget of IROP is €660 million, which is comparable to the NGS. OPE focuses energy performance through increased insulation in buildings, recovery of waste heat, and boiler replacements in buildings and industrial settings. Its budget was with €910 million larger than the NGS. The PANEL Programme provided financial assistance for the reconstruction and modernisation of appliances in multifamily buildings such as elevators and had a smaller budget of around €90 million (von Manteuffel & Dinges, 2018). In theory, projects can be financed by more than one program, but the NGS Programme was designed to minimise overlap and double funding.

5.5.2 Programme design and setup

The Green Savings Programme was established by the Czech Ministry of the Environment in 2009 and is administered by the State Environmental Fund (SEF). It was renewed and relabelled as the NGS Programme in 2013. The entire programme has had three phases so far.

- In Phase I from 2009 to 2013, it was called Green in Savings Programme.
- In Phase II in 2013, it was replaced by the New Green Savings 2013 Programme.
- In Phase III from 2014 to 2021, it is called the NGS 2014+ Programme.



The goal of the programme, which remained unchanged over all phases, is to achieve energy savings in final consumption and to stimulate the Czech economy with other social benefits, such as improving the quality of housing of its citizens, improving the image of towns and villages, and starting up long-term progressive trends (SEF, 2020). Each phase had a separate budget (see Table 16) (SFZP, 2020).

The NGS promotes energy efficiency renovation projects in single-family buildings across the entire Czech Republic and apartment building renovations within the City of Prague (MURE, 2018). Apartment buildings outside of Prague are covered by the IROP. Owners or builders of such dwellings are eligible; public buildings have only been eligible since 2016. Three different funding streams exist for single-family buildings.

- Stream A is about improving the energy performance of single-family houses through better insulation.
- Stream B is about constructing single-family houses with very high energy performance.
- Stream C funds renewable energy sources.

For apartment buildings, there are just two funding streams: support for improvements in energy efficiency through insulation and support for renewable energy. Figure 6 provides examples of supported measures in each of the funding streams. ESCOs are only involved in the renovation of apartment buildings because single-family homes are usually renovated by owner-occupiers.

Figure 6: Funding Streams and Supported Measures

 Family Houses			 Apartment Buildings	
A: Insulation	B: Construction	C: Energy Sources	A: Insulation & Resources	B: Construction
Replacement of Windows	Construction of new low or plus energy houses	Solar thermal or PV systems	Insulation of walls, roofs, ceilings,	Construction of apartment buildings with very low energy consumption
Insulation of walls		Electric Heat pumps	Replacement of windows	
			Solar thermal and PV systems	

Source: Guidehouse

The NGS is not combined with other programmes (e.g. the IROP targets apartment buildings outside of Prague and is the reason why the NGS only targets apartment buildings within the city of Prague). However, the Czech government has identified this fragmentation as a barrier and is discussing the development of a one-stop-shop platform for energy efficiency renovations for the next phase of the programme from 2022 to 2030.

5.5.3 Financial Mechanism

The original Green Savings Programme was funded out of the proceeds from unused European Union Allowances and the European Union Aviation Allowances of the Kyoto Protocol. These allowances could be traded because the Czech Republic has been able to stay below its assigned amount of GHG emissions. The NGS is funded by proceeds from unused EU ETS certificates and supplemented by ordinary state funds (Ministry of Environment of the Czech Republic, 2017). The budget for Phase III is around €700 million. Phase IV, which is expected to run from 2022 to 2030, will be more heavily financed by the general budget as surplus EU ETS certificates and corresponding revenue are expected to decline.

Projects are completely prefinanced by the applicants, and subsidies are only claimed after the successful conclusion and evaluation of the project. This means the entire project risk lies with the homeowner or, in the case of apartment buildings, the project developer. Applications occur via an online tool and were significantly simplified for Phase III. Interested parties are first asked to check if their project is eligible and if they can afford the upfront cost. The website features an online calculator to help applicants estimate their indicative subsidy, savings, return on investment, and operating costs in advance. In a second step, project documentation and energy evaluation of the building needs to be performed by licenced specialists. Specialists are licensed by the Ministry of Trade and Industry independent of the NGS under the Energy Management Act and need to be paid for by the homeowners or the project developers in the case of apartment buildings. Once this expert opinion is collected, it can be uploaded, together with an application form detailing the technical specifications. When the application is reviewed, applicants receive a formal letter of acceptance by mail. The review process takes between 4 and 6 weeks. During the project implementation, the energy specialist functions as technical supervisor and is advised to be independent of the construction company. Once the project is implemented, it needs to be reported to SEF, which happens through documentation by the licenced specialist and additional documents such as invoices and technology-specific documentation such as a proof of connection to the distribution grid for PV installations. Within 3 weeks of approval of the final reporting, the grant is paid out (SEF, 2019).

The level of funding depends on the calculated energy savings before and after the

implementation and covers up to 50% of the total eligible expenses for single-family homes and 30% for apartment buildings. Absolute limits exist as well; the construction of new passive houses is supported up to a maximum of €20,000 and the installation of new heat pumps or boilers with around €4,000. Average funding amounts are around €3,600 for single-family homes and €17,600 for apartment buildings. All projects that meet the technical requirements are subsidised and have 12-36 months to complete the project. SEF considers applications either until the end of the programme in December 2021 or until the budget runs out (SEF, 2019). Applications run through the central programme website, which also offers general information about the different funding streams, a country-wide optional list of experts and suppliers that have experience with the programme, an optional list of suitable products and materials, and a step-by-step application and implementation guide. Quality assurance happens by requiring the input from the above-mentioned licensed specialist, the technical supervisors, and the ex post review by SEF before the grant is paid out.

5.5.4 Impact

Table 16 provides programme statistics and details on the impact each of the different phases had. Overall, the programme is considered a success and was well-received, both within the Czech Republic and outside of it. Outside attention often focuses on the novel financing structure of the programme, which allows the programme to exist with minimal state funding.

Table 16: Impact and KPIs of the (New) Green Savings Programme

Category	Indicator	Result
Economic	Total investments in energy efficiency (€)	Phase I (2009-2013): ~€700 million (Inherit, 2018) Phase II (2013): ~€40 million Phase III (2014-2020): ~€370 million (Hrbek, 2019)
	Average subsidy ration	Single-family houses: 37% of investment costs Apartment buildings: 19% of investment costs
	Number of projects realised (#)	Phase I (2009-2013): 74,050 projects with annual savings around 710 kt CO ₂ per year. (Ministry of Environment of the Czech Republic, 2017) Phase II (2013): 3,763 projects Phase III (2014-2020): 75,500 single-family housing projects and 864 apartment building projects (February 2020)
	Return on investments (monetary savings from energy investments [€]/ investment costs [€])	Ministry of Environment estimates that after 7-13 years the savings due to energy efficiency start to pay off for the owner. (Ministry of Environment of the Czech Republic, 2017) The return on investment in terms of energy saved is estimated at around 3.36 GWh per subsidised million euros for single-family houses and 5.66 GWh for apartment buildings.
Technical	Estimated energy savings made in final energy consumption (MIT, 2017)	Phase I (2009-2013): 5,900 TJ Phase II (2013): 376 TJ Phase III (2014-2020): 5,031 TJ
	CO ₂ savings	1,388 thousand tons CO ₂ / year (2017 estimate) (Ministry of Environment of the Czech Republic, 2017)

5.5.5 Co-benefits

The main benefit for participants in the programme is the savings that arise over time from the increased energy efficiency. From the government's perspective, the main benefit is the energy saved and the reduced carbon emissions, which contribute to the Czech Republic's 2020 emissions target. Beyond these immediate benefits, several co-benefits arise for

participants in the programme and the government alike. Refurbished houses and apartment buildings usually have an increased lifespan, and often the renovation increases the quality of life inside the building as well. While there was no effect on GDP growth estimated in any evaluation, SEF indicated that the development of the construction market profited in the long term through the increased demand of more energy efficient materials (Hrbek, 2019).

5.5.6 Success factors and barriers

Table 17 lists the main success factors and barriers of the programme. As for most new programmes, one of the main barriers was to publicise the programme in the beginning and to convince people they could gain from the programme. The programme was advertised on a local level in town hall meetings and in regional and construction fairs. A transparent and clear communication strategy about the benefits helped with the uptake. For example, educating people that higher quality insulation and materials cost more in the beginning but also lead to higher savings afterwards was crucial (Hrbek, 2019).

An additional success factor is a straightforward application procedure, which makes it as easy as possible for applicants to apply and find relevant information. An unsolved barrier is the prefinancing of the investment that the programme requires. While this was never properly evaluated, it can be assumed this hindered low-income households from participating in the programme. Some misuse by licensed specialists was reported, where specialists only collected fees for providing the documentation without properly supervising the construction, which led to substandard renovations. (Sochor, 2020).

Table 17: Success factors and barriers of the NGS

Success factors	Barriers
<ul style="list-style-type: none"> • Publicity in the beginning: Publicising the project in the beginning in town hall meetings and construction fairs to reach homeowners and professionals. • Transparent and straightforward application procedure: An easy to understand and apply to programme helps increase the uptake. • Transparent communication of benefits: Once people understood the project can cost money during the renovation but saves money through the increased energy efficiency, uptake increased. • Quality assurance: The certified technical specialists and supervisors help ensure quality in the absence of predefined energy efficiency targets. • Savings dependent funding: Amount of funding depends on calculated and ex post evaluated energy savings, which provides an incentive for deep and ambitious energy renovations. 	<ul style="list-style-type: none"> • Convincing people of the benefits: A survey showed that many households were initially sceptical about the benefits of doing a renovation supported by the program. • Publication and overcoming prejudice: Initial uptake and prejudice about the programme slowed its uptake but were eventually overcome by advertising and targeted education. • Prefinancing: Prefinancing excludes households that cannot prefinance the renovation. • Fragmented support landscape: The fragmented support schemes make it more difficult for applicants than a one-stop shop scheme would have. • Potential misuse through specialists: The involvement of private but licenced specialists, while allowing easy scaling up of the scheme, can also increase concern about misuse of project funds.

Source: Guidehouse based on Hrbek, 2019

6. Benchmarking and key success factors

6.1 Introduction

Initially, the study envisaged creating a benchmark along which the five programmes from the case studies could be compared. However, the case studies demonstrated significant differences between the programmes' main characteristics and lifetime, which made a benchmark unfeasible. Some programmes such as the NGS have already run for 10 years,

while the Flemish Revolving Energy Fund was implemented as recently as 2019. Some target a wide range of applicants, while others focus on low-income groups (Flemish Revolving Energy Fund) or EPCs for multifamily apartment buildings (LABEEF). To capture the entire bandwidth of the five programmes, the results of the case studies' analyses focus on overarching leading practices and success factors instead of a benchmark based on certain indicators, which could lead to important information being lost by aggregation. The success factors were identified for each case study.

Table 18 provides an overview of the five programmes along four different dimensions: type of instrument, target group, ambition level of energy efficiency, and supported measures. In particular, the type of instrument category indicates that the financial setup of each programme is different and often even covers more than one instrument (e.g. both grants and loans); this difference can result from changes implemented over the course of the programme lifetime (i.e. KredEx) or because the programme was initially set up to provide two separate types of funding.

Table 18: Comparison of main programme features

Scheme	Type of Instrument				Target Group			Ambition Level of Energy Efficiency			Supported Measures			
	Grant	Loans	Guarantees	EPCs	Single-family houses	Multifamily houses	Public buildings	Shallow	Medium	Deep	Insulation	New construction	Switch to renewable energy carrier	Energy efficient heating system
Flemish Revolving Energy Fund														
JESSICA2 Loans														
KredEx														
LABEEF														
NGS														

6.2 Relative indicators

Table 19 lists the available quantitative indicators of the five programmes, split into the general, economic, and technical categories. The general indicators aim to highlight the fundamental differences between the programmes, such as duration and type of investment. The economic indicators separate the investments into private and public, show the numbers of projects realised, and the average investment made. Technical criteria, which are often used as a benchmark, are only sparsely available and encompass saved energy and GHG emissions as well as the energy efficiency target.

A closer look at the available indicators reveals that no straightforward benchmark can be drawn from the collected data. Programme duration differs significantly between programmes, as do the type of the investment provided. The largest and longest running scheme is the NGS. While the observation period for KredEx is similarly long, the budget is considerably smaller. The Flemish Revolving Energy Fund is the latest scheme, having started its interest-free loan programme only in 2019. The total investments realised show a similar relation. The NGS is the largest programme, with over €1 billion of investments, while LABEEF is the smallest with just €1.6 million. The size of the budget also reflects the number of projects that have been realised by each programme, which can consist either of

single-family houses for the Flemish Revolving Energy Fund and the NGS or multifamily houses as in LABEEF, KredEx, JESSICA Loans, and the NGS. The average investment for a single-family house is between €10,000 and €25,000 and €100,000 and €260,000 for multifamily houses.

Most technical criteria are not available for each programme, making direct comparisons between all five difficult, but Table 19 provide an overview of the most relevant parameter of each programme.

Table 19: Available quantitative indicators

Category	Indicator	Flemish Revolving Energy Fund	KredEx	LABEEF	JESSICA2 Loans	NGS
General	Programme duration/period of observation	2020-	2009-2014*	2016-2020	2017-2020	2014-2020
	Type of investment	Loan	Grant	EPC loan	Loan	Grant
Economic	Total investments in energy efficiency (in million €)	15.5	150	1.6	21.6	1,071
	Estimated private finance leverage factor	N/A	1:3	100%	1:0.7	SFH: 1:2 MFH: 1:4
	Grants/subsidies/loan (in million €)	15.5	38	0	14.1	SFH: 350 MFH: 21
	Owner/private contribution (in million €)	N/A	40	1.6	8.5	SFH: 600 MFH: 110
	Number of projects realised (#)	SFH: 625	MFH: 661	MFH: 6	MFH: 253	SFH: 75,500 MFH: 864
	Average investment sum per project/ building (in thousand €)	25	227	266	118	SFH: 9.7 MFH: 93
	Investment per m ² (in €)	165	250	200 - 300	N/A	N/A
Technical	Saved final energy consumption (in GWh/year)	N/A	75	N/A	39	230
	Reduced CO ₂ emissions (tCO ₂ /year)	N/A	15,000	N/A	6,657	1,388
	Target amount of saved final energy	10%-20%	40%	57%	32.2%	N/A

SFH = single-family home; MFH = multifamily home

* The KredEx fund is ongoing; the reported numbers refer mostly to the indicated period, however.

Source: Authors based on publicly available data and interviews

6.3 Success factors

The lack of comparable technical indicators and the differing nature of the various schemes make a benchmark in the more classical sense unfeasible. Therefore, this section identifies success factors based on case studies and structures along all phases of a financial scheme.

1. **Information or marketing phase**, in which potential applicants look for information about an energy efficiency programme, or if looked at from the implementing agency's perspective, the programme is being advertised to potential customers.
2. **Project design and sales phase**, advising the potential applicant in terms of benefits of the renovation, financial and technical options, and the technical assistance provided.
3. **Application phase**, where the applicant is in contact with the implementing agency to properly prepare and submit the application.
4. **Construction phase**, in which the energy efficiency renovations and new buildings take place.
5. **Evaluation and redesign phase**, which should expose potential free riding and misuse of programme funds and provide recommendations to improve the programme. These recommendations ought to be based on KPIs such as energy savings achieved, number of applicants reached, and cost efficiency of the programme and be done periodically.

The classification of leading practices in these phases serves to standardise the process of programme participation as far as possible, and reduce participation costs for all involved parties. All five phases and the corresponding success factors are discussed in the following sections.

6.3.1 Information and marketing phase

The information or marketing phase is the first contact point of a customer with the energy efficiency programme or scheme. An effective marketing phase is essential for a rapid uptake of a new scheme and high continuous participation in existing schemes. Therefore, it is helpful to create a one-stop shop for all energy efficiency schemes. A one-stop shop such as a physical contact point for personal advice and a central website will likely increase the initial contact of individuals with the programme because there is only one central point of contact. Ideally, this central point of contact should remain the same throughout the entire program; this point of contact should simultaneously coordinate the application and offer technical assistance for the financial setup, energy audits, and technical supervision during the construction phase. The physical contact point requires different skills to cover the various needs throughout all phases.

If different programmes are combined in such a platform, it is advisable to align the different processes as far as possible, which should help in automating the application process. Ensuring compatibility between the different programmes, if possible and desired, can help to increase uptake, as applicants take advantage of additional subsidies and consistent requirements. For transparency and regulatory reasons, different programmes ideally do not overlap in their support but are complementary.

Such a programme should be accompanied by an information and marketing campaign, focused on communicating the costs and benefits and ease of participation (e.g. lower

energy costs, increased standard of living, better health, property valuation, and other concrete examples). Promoting energy efficiency on a standalone basis will likely not grow the pipeline. Most programmes offer such clear benefits, such as subsidies or below market interest rates; these should be highlighted.

Such campaigns need to be targeted specifically to the relevant groups (e.g. single-family homeowners, private and commercial landlords, low-income households) and depending on the type of programme, be implemented with the involvement of intermediaries such as local communities, NGOs, energy advisors, architects, ESCOs, construction companies, etc. These local partnerships, such as the register of licensed energy experts in the Czech Republic for the NGS Programme, can support the pipeline growth and scaling up of a programme, whereas one-stop shops can simplify the uptake and the administrative process—clients can have all information and guidance they need. A balance between a one-stop shop and using the power of these intermediaries (getting them onboard, teaching them about the programme, etc.) should be found.

It can be beneficial to communicate the self-qualifying eligibility of the scheme for certain groups to lower the hurdle of information and application. Such self-qualification with other (social-) programmes can help reduce administrative costs and ease the burden of applications, both for the applicant and in terms of administrative staff to process applications. This has been done by a Weatherisation Assistance Programme (WAP) in the US that specifically targets low-income households (cf. <https://www.benefits.gov/benefit/580>).

Moving from one phase to the next, it is important that applicants are not dropped off at the next phase. More continuous support with different functions and experts (information, application support, technical and financial expertise, supervision) and a smooth handover from one phase to the next will make applicants more receptive to advice by the technical expert and provide applicants with more security in the process.

6.3.2 Project design or sales phase

Second is the project design or sales phase. In this phase, homeowners have indicated their interest in the project, and a proactive follow-up by the implementing agency is needed to finalise the sale (i.e. finish the project design and secure needed financing). The involvement of construction companies, installers, architects, and ESCOs in the project design process, before the final project design and financing is finalised, allows the programme to provide meaningful technical assistance. Here it is advisable to build up a large network of licenced partners that can provide technical assistance close to the customer and potentially even support the application process before the project design.

The technical assistance can also be used to support homeowner in drawing up an individual building renovation passport, aligning renovation measures in financially manageable pieces and combining it with a bonus when homeowners implement the full roadmap. The early involvement of technical assistance will also facilitate a higher quality standard in the planning phase.

A mandatory energy audit for nonstandard measures would be advisable to record the energy performance status of the building and propose suitable technical solutions. The energy audit could be (partly) financed through the programme, if the applicant decides to take part in it, and reimbursed by the applicant if they decide not to proceed further. The takeover of the energy audit costs allows both appropriate planning and an incentive to effectively renovate the building.

To incentivise deeper energy efficiency renovations, some schemes have linked the subsidy

amount to the amount of saved energy after the renovation. Incentives, both financial and administrative, should be focused on making projects viable for financing by the private sector, where possible.

Programmes focused on single or multifamily houses with a fragmented ownership structure such as LABEEF or the Flemish Revolving Energy Fund further benefit from a special organisation with a local NGO, which represents the interests of the different owners. Such organisations can be hugely beneficial to the relationship between the programme and the applicants when local partners are directly involved in the sales phase. Support or acknowledgement for such measures targeted at a specific programme setup are essential for the individual success of a programme.

One key sales argument are the added benefits that a deep energy efficiency renovation might bring, especially if other amenities can be renovated alongside. These additional benefits include health, safety, and comfort alongside the reduced energy consumption.

6.3.3 Application phase

The third phase is the application phase. Once potential applicants have informed themselves about the programme and been advised, a sufficiently large number of them are supposed to apply for the programme. To reduce this hurdle, the application procedure needs to be as simple and straightforward as possible. Depending on the setup of the programme, existing channels such as banks, ESCOs, installers, energy advisors, or a newly created (online) one-stop shop with prefilled forms can be used for application. The KPI here is the conversion rate - the number of applicants divided by the number of households or landlords reached. Local partners can be (financially) incentivised to promote the programme actively, as long as incentives are made clear and participants are not urged to perform unnecessary renovations.

Programmes that focus on apartment buildings need to provide special support during the application phase. The often-fragmented ownership structure or the inclusion of HOAs into the process means that more interests need to be aligned. Fine-tuning programmes to national legal requirements and the relevant target group is necessary.

6.3.4 Construction phase

During the construction phase, the supported energy efficiency measures are implemented. Depending on the financing of a possible energy audit, the construction phase is the point when programme participants are usually first financially burdened through the participation in the scheme. Depending on the type of scheme and renovations, this can be a significant amount of money. If a scheme is prefinanced (e.g. the subsidy is disbursed only after the renovation has been successfully audited as in the NGS), then participation is much more difficult for low-income households. This can be mitigated by not obliging applicants to prefinance measures but instead providing the subsidy at the point in time the costs actually occur, potentially providing a higher subsidy for low-income households. Another possibility is to finance any renovations through a more sophisticated advanced financial mechanism such as an EPC, as LABEEF does in Latvia. In this case, a facility is needed to take over the long-term payment contracts from the partnering ESCOs, enabling them to pursue additional renovations. Other innovative financial products can be found in the policy recommendations chapter (cf. Table 21).

If the costs of the initial energy audit were carried by the participant, the construction phase also offers the possibility to (partially) reimburse those, as the participation in the programme is secured at this stage.

Technical assistance should be provided throughout the construction phase, ideally by the same actor as in the application and sales phases. This way a continuous customer journey can be guaranteed, and the technical assistance can oversee the quality of the construction measure. Such technical assistance can be provided through a network of licensed energy specialists or ESCOs.

6.3.5 Evaluation and redesign phase

The final phase is the evaluation and redesign phase. The two main tasks in this phase are to evaluate the construction work (i.e. its impact) to ensure a consistently high quality over the duration of the scheme/contract as well as the scheme itself. The construction audit ensures quality on the part of the construction company and can be conducted by the technical assistance team. This work needs to take part during the construction phase to be able to intervene, if necessary. After sufficient time has passed, it is essential to properly evaluate the entire programme. Such a process evaluation can offer valuable insights into programme-specific barriers and success factors, so the programme can continuously be improved. Some questions to consider:

- Is the programme open to all target groups?
- Can low-income households successfully participate?
- Does the support potentially interfere with other social measures?
- Do the energy savings achieved correspond with the energy savings targeted?

This process can also deliver leading practices to share and convince further potential applicants. For example, does the legal framework allow for the more innovative solutions, such as EPCs, or even on-bill financing or energy efficiency mortgages?

Any renovations should aim to be compatible with the 2050 climate targets as well as corresponding existing standards. This avoids any lock-in effects and necessary additional renovation measures to meet the required standards. The programme setup needs to be flexible enough to allow for simultaneous implementation of general, privately financed, renovation measures and should regularly be evaluated with regard to its compatibility.

In general, energy efficiency renovation programmes should be as simple, lean, flexible, and streamlined as possible, saving administrative costs and making it easier for each applicant to access the programme. Local partnerships can help broaden the programme quickly and ensure a high quality of renovation measures.

Table 20: Overarching success factors of financial instruments

Information/Marketing Phase	Project Design/Sales Phase	Application Phase	Construction Phase	Evaluation/Redesign Phase
<ul style="list-style-type: none"> • Create a one-stop shop for energy efficiency support. • Enable compatibility with other programmes to increase impact. • Clearly communicating costs and benefits (including non-energy benefits) for participation is needed, ideally supported through an external evaluation/study. • Self-qualification for a scheme can help to target a specific group and simplify application procedures. • Publicise the programme information and the benefits to households, construction companies, installers, architects, and ESCOs through multiple channels (on the ground, local agencies). 	<ul style="list-style-type: none"> • Proactive follow-up through the scheme or implementing agency to close the sale. • Provide some form of technical assistance that can also support the applicant—e.g. through a network of licenced experts. • Develop an individual building renovation passport for each homeowner. • Request mandatory energy audits or technical assistance before defining measures that will be put into the project design. • Focus on multiple benefits from renovation (health, safety, energy efficiency). • Depending on the programme and legal setup, proactively market to homeowner associations. 	<ul style="list-style-type: none"> • Easy and straightforward online application procedure through existing channels such as house banks, energy providers, or one-stop shop. • Link the level of support to achieved savings to incentivise deeper renovation measures. • Provide special support for tenant management in multi-apartment projects with fragmented ownership structure (applicable only to multifamily housing schemes). 	<ul style="list-style-type: none"> • Prefinancing schemes are difficult for lower incomes to participate in. Provide special options for low-income households if general scheme setup is prohibitive for lower incomes. • High quality technical assistance of the construction works through a network of licensed actors. • (Partially) Reimburse cost of assistance through the programme. 	<ul style="list-style-type: none"> • Require an ex post evaluation through a technical assistance network if technical assistance was not already provided throughout the scheme. • Evaluate entire scheme to identify possible improvements, including customer journey. • Ensure that support for low-income households does not reduce general welfare payments. • Enable legal framework for energy performance contracting (EPC) based on private sector initiatives or other innovative solutions, such as on-bill financing or energy efficiency mortgages. • Funds and requirements to be linked to renovations needed for 2050 standards.

7. Policy recommendation and complementary measures

Informed by the previously identified overarching success factors and barriers of the case studies, which are aimed at designing financial schemes well, we provide further abstract policy recommendations. The goal is to streamline the financing of energy efficiency renovations to encourage private investments, including through innovative models, and increase energy efficiency renovations in general, both at the European and on Member State levels.

7.1 Background

The Energy Efficiency Directive (Directive 2012/27/EU, EED) is, together with the Energy Performance of Buildings Directive (Directive 2010/31/EU, EPBD), the foundation of a common EU policy on energy efficiency renovation. The original EED required Member States to implement and report a long-term renovation strategy of residential and commercial buildings, both in private and public ownership. With the amendment Directive (EU) 2018/844, the long-term renovation strategy was strengthened and moved to the EPBD. The updated EPBD calls for an increased effort in the mobilisation of financial instruments for energy efficiency renovations in buildings. To this end, various private and public financial mechanisms are available to Member States (Economidou, Marina; Todeschi, Valeria; Bertoldi, Paolo, 2019). The goal is to finance deep energy efficiency renovation measures and increase the share of nearly zero-energy buildings (Art. 2a, EPBD). This not only includes renovations but also regulations for newly constructed buildings, which are required to comply with the nearly zero-energy building standard from 2021 onwards.

As part of the climate mainstreaming of the European Green Deal, the European Commission increased the budget share that needs to be spent on climate action in the forthcoming multi-annual financial framework from 20% to 25% (European Commission, 2020a).

The latest policy development is the Renovation Wave, which is part of the European Green Deal. The Renovation Wave is the European Commission's new strategy at increasing the renovation rate across the EU, breaking down the barriers to renovation and aiming to renovate 35 million inefficient buildings by 2030. To this end, adequate finance via the Next Generation EU, the 2021-2027 MFF, and other EU and private funds like InvestEU will be made available by providing more grants, loans, guarantees, technical assistance, and project development support as well as by combining different sources. The financing also includes, for example, well-targeted funding of the newly created Renovate and Power up flagships in the Recovery and Resilience Facility (RRF) of the Next Generation EU package.

In addition, after assessing the National Energy and Climate Plans (NECPs) and the Long-term Renovation Strategies (LTRSs), the Commission will support Member States in preparing Recovery and Resilience Plans that take building renovation into account as a part of it. Existing concerted actions, such as the Concerted Action on the Energy Efficiency Directive and the EPBD with its focus on long-term renovation strategies, will be strengthened. The EPBD will also be revised in the process and a deep renovation standard will be created (European Commission, 2020c). Including Building Renovation Passports and Logbooks and creating a central database for the Energy Performance Certificates as a tool for monitoring would help to assess the financial support needed for renovation support.

These overarching policies of the renovation wave are complemented by more concrete

tools, building on existing initiatives by the European Commission and the European Investment Bank (EIB). These initiatives aim to increase the funding available to or the efficiency of existing schemes as well as facilitating an exchange of knowledge and expertise. One such example are the Structural Funds such as the ERDF and the Smart Finance for Smart Buildings (SFSB) facility, which is part of the Clean Energy for All Europeans package. The SFSB is a newly created financial instrument and is managed by the EIB. Its aim is to make investments in energy efficiency projects in residential buildings more attractive to private investors. For that, the EU uses grants as guarantees (European Commission, 2018). Additional support is provided through the ELENA programme, which is also managed by EIB and supports public and private institutions in implementing energy efficiency measures, providing technical assistance, and creating sustainable residential housing, urban transport, and mobility projects (European Investment Bank, 2021). Other EIB-managed funds include the JESSICA fund, which provides loans and guarantees, and equity investments for national programmes, including for energy efficiency.

Indirect support for energy efficiency measures is provided through capacity building measures, such as the Energy Efficiency Financial Institutions Group (EEFIG), which aims to de-risk energy efficiency investments for the financial sector through knowledge sharing, scaling up industry-leading practices, and developing an underwriting toolkit. The EEFIG could also take on a leading role in establishing leading practice for the implementation of the energy efficiency requirements in the EU taxonomy (European Commission, 2020b).

The Sustainable Finance Taxonomy is a way of providing the financial sector with a definition of when a financial product can be considered sustainable. To this end, the European Commission has tasked the Technical Expert Group (TEG) with defining the environmental taxonomy, which includes buildings and renovation efforts. In its final report, the TEG specified under which circumstances activities in the construction and real estate sectors can be considered sustainable in the sense of the sustainable finance taxonomy, among other things (European Commission 2020b). These criteria are aimed at providing investors with clarity about what kind of energy efficiency investments are considered sustainable and should help to scale up private investment into these areas. The technical annex to the final report specifies these criteria in greater detail. A continuous monitoring of the criteria will be provided through the Platform on Sustainable Finance, which is also tasked with the future monitoring and development of the sustainable finance taxonomy as a whole. The [Taxonomy Regulation](#) (Regulation (EU) 2020/852 (Taxonomy) on the establishment of a framework to facilitate sustainable investment) was published in the Official Journal of the European Union on 22 June 2020 and entered into force on 12 July 2020. It establishes the basis for the EU taxonomy by setting out overarching conditions that an economic activity has to meet in order to qualify as environmentally sustainable.

7.2 Recommendations on the EU level

In general, three recommendations on the EU level are outlined:

- Harmonise the financing guidelines (standards and targets) across its various financing instruments and targets.
- Develop and provide proper reporting, requesting information to allow for both an evaluation of the process and the impact of various financial instruments; support transparency.
- Facilitate the exchange between Member States so that leading practices can be easily adapted and implemented by other Member States.

The harmonisation of guidelines has two dimensions: standards and targets.

First, standards in terms of minimum energy or carbon performance standards, CEN standards, a deep renovation standard compatible with the climate target between the various financial instruments of the European Commission, the EIB, and the Member States: This means that standards and requirements for the structural funds, the investment facilities such as SFSB, the knowledge sharing mechanisms, and the sustainable finance taxonomy should be harmonised. Renovation projects under a structural and investment fund, ELENA, or from the Renovate facility from the Next Generation EU fund should fulfil all minimum standards in terms of the energy savings achieved, as defined by the taxonomy. This will simplify administration for financial institutions and managing authorities and make them more coherent for applicants. For example, the taxonomy could be used as a reference value, allowing for continuous development of the taxonomy standards.

Secondly, these guidelines and standards should be aligned with the targets set by the European Commission, most notably reducing emissions by at least 55% and renovating 35 million buildings by 2030. In the case of the taxonomy, this should be the task of the Platform on Sustainable Finance.

The harmonisation might also include a consolidation of different EU programmes, schemes, and initiatives to clean up the organic growth of the policy and funding landscape in this area and make it possible to combine them more easily. Additionally, it needs to be ensured that no adverse incentives occur between the different financial instruments and the overall climate targets. That is, financial instruments should not support sub-standard renovations that are not compatible with the overall climate targets of the European Green Deal (i.e. an emissions reduction of at least 55% by 2030).

Thirdly, the European Commission should develop and provide proper reporting guidelines or templates to Member States so the financial schemes can be evaluated both on the impact they achieve and their process. The reporting could be part of the long-term renovation strategies of the Member States. For example, does the scheme work as it was intended in terms of target groups reached, energy savings achieved, and cost efficiency? A recent evaluation by the European Court of Auditors showed that a better focus on cost efficiency in energy efficiency schemes has a huge potential to realise additional savings (European Court of Auditors, 2020). As indicated in the previous chapter of this report, many renovation schemes are not properly evaluated along the various dimensions of a financing scheme. Coordination and assistance can be improved through the European Commission to measure the impact and increase transparency and to make the best use of the funds supplied and adjust these schemes in a timely manner, if necessary.

Fourthly, an effective exchange between Member States on industry-leading practices should be facilitated—e.g. through continuous exchange in the Concerted Action on Energy Efficiency Directive, the Concerted Action on EPBD, the Energy Efficiency Financial Institutions Group, or future Horizon Europe projects. Leading practices on existing or new schemes should be shared across Member States and at the local level (e.g. municipalities); assistance should be made available where it is needed.

Beyond facilitating an exchange on instruments and leading practices, the EU should further increase the awareness and technical expertise of energy efficiency measures in the financial sector. The taxonomy and the EEFIG are both steps in the right direction and should be pursued further. Additional research in new financial instruments, such as an energy efficiency mortgage, could further increase the involvement and interest of the financial sector (cf. <https://eemap.energyefficientmortgages.eu>). One example could be exchanging leading practices and support for setting up EPC schemes based on the experience collected in markets with a large stock of prefabricated buildings and fragmented ownership structure. This capacity building for the financial sector needs to be matched with capacity building for the public sector (i.e. implementing agencies and municipalities), as

these often turn back to inefficient grant schemes due to their lack of financial knowledge.

7.2.1 Conclusion

On an EU level, numerous initiatives and funds are already on the right path for financing energy efficiency measures. The focus should be on continuing and extending its existing efforts, such as the structural funds and capacity building for the public and financial sectors and across Member States. This exchange on different financial instruments can speed up the EU-wide implementation and delivers valuable information how to make the best use of these for different types of investors in energy efficiency in buildings. A swift implementation of the delegated acts further specifying the energy efficiency criteria for the taxonomy and their subsequent implementation in the Member States should be a priority. The EU-wide implementation will create a level playing field for energy investments by financial institutions across all Member States.

7.3 Recommendations on the Member State level

Member States have already implemented country-specific support schemes and connected financial instruments. Country-specific features, such as the housing stock, the ownership structure, socio-demographic characteristics, the legal framework, and the ESCO market, are quite heterogeneous across the EU. Therefore, a one-size-fits-all solution for all Member States seems unsuitable. Nevertheless, some general policy recommendations are possible.

For example, the general policy recommendations for the EU level can be applied on a Member State level as well as overall specifications; other recommendations, such as the implementation of new and innovative programmes, are targeted more to national level.

- Harmonise the standards and requirements of different national schemes with a soon-to-be harmonised EU framework, most likely through the sustainable finance taxonomy as a minimum standard.
- Pool, coordinate, and incentivise the use of different financial instruments and, where needed, test new innovative solutions.
- Align the national sector targets, if existing, with the EU targets, namely the renovation wave in the medium term and the 2050 goals in the long term.
- Monitor and regularly evaluate the schemes, both in terms of impact and process; and if need be, adjust accordingly.
- Set up platforms to work closely with the financial sector and to advance further capacity building in both the financial and public sectors.

Firstly, the harmonising the standards and requirements of national schemes through the sustainable finance taxonomy should result in more transparency for the applicants; facilitate the combination of different sources; and enable easier engagement of the financial sector in national renovation schemes. This includes any forthcoming changes to existing programmes, which should facilitate compliance of the underlying financial product with the taxonomy criteria to enable broad private sector usage of the financial product. The taxonomy should function as a lower threshold, defining only a minimum standard and allowing Member States to set standards stricter than the taxonomy (e.g. aligning standards already with the 2050 goals and require passive houses). Beyond the standardisation, the focus should be on a rapid implementation of the taxonomy requirements and subsequent translation into national law to help attract private capital to energy efficiency renovation, both from national and international sources. Programmes financed by MFF funds and

national recovery funds should be designed together to reach alignment and higher impact.

Second is the alignment of existing national sector targets with EU targets. The goal here is not to have any lock-in effects through costly sub-2050-standard renovations.

The third recommendation is to pool, coordinate, and incentivise the use of different financial schemes. Different support schemes tend to grow organically, which can leave the support landscape fragmented and confusing to potential applicants and the private sector. This goes also for the variety of EU funding mechanisms and the conditional and often complex access. A more outreaching approach coordinated by the European Commission could facilitate the knowledge and use by the Member States of these mechanisms. Streamlining different schemes, allowing blending of different sources, and possibly introducing a one-stop shop for financial support for energy efficiency renovations could be of help here. If necessary, Member States should test new and more innovative financial instruments, as indicated in Table 21 **Error! Reference source not found.**, to either increase their renovation rate or target a specific group. This type of scheme could be incentivised in pilot schemes and closely monitored to derive recommendations for tailoring them and creating a bigger variety of instruments to meet the needs of as many different types of investors and national contexts as possible.

Table 21 **Error! Reference source not found.** provides an overview of different financial instruments. While not every national market will be large enough to sustain multiple instruments, it is very likely that the number of financial instruments in each market will increase with demand for a more rapid renovation. One example is the EuroPACE integrated home renovation platform, which started the trial of its HolaDomus scheme in Catalonia, Spain, in early 2020. It combines grants and subsidies with affordable financing.¹¹

Table 21: Type of financial instruments for building renovations

	Traditional and well-established	Tested and growing	New and innovative
Non-repayable reward	Grants and subsidies Tax incentives	Energy efficiency obligations Pay-for-performance support schemes	Energy efficiency feed-in-tariffs
Debt financing	Soft loans Leasing	EPCs Energy service agreements Revolving funds Commercial loans	Energy efficient mortgages Property Assessed Clean Energy Program (PACE) On-bill finance Crowdfunding Energy savings tenders Energy savings tariffs
Equity financing		EPCs Energy service agreements	Crowdfunding

Bold instruments highlighted by the authors to indicate the instruments discussed in the case studies.

Source: Adapted from Economidou, Marina; Todeschi, Valeria; Bertoldi, Paolo (2019): *Accelerating energy renovation investments in buildings. Financial and fiscal instruments across the EU*. Luxembourg: Publications Office of the European Union (JRC Science for Policy Report, 29890).

The fourth recommendation is to continuously monitor and regularly evaluate schemes and instruments, both on their impact and their process. This process should influence the second recommendation, testing new financial instruments if existing ones are no longer suitable or deemed inefficient.

¹¹ <https://www.europace2020.eu/>

The last recommendation is that Member States set up platforms to work closely with the financial sector and to advance further capacity building in both the financial and public sectors.

The additional recommendations made as follows are based on the insights gained in the case studies and the subsequent distillation of industry-leading practices. The case studies only covered instruments from the “Traditional and well established” and “Tested and growing” categories of Table 21. No recommendations for the New and innovative category can be provided.

General: Programmes, independent of the underlying financial instrument, should focus on providing the right framework for a speedy private sector uptake. This includes certified technical advisors or another suitable method to provide high quality technical advice, stricter supervision during implementations through inspections, and more pressure to private actors to perform energy efficiency renovations measures when doing general renovation measures. This recommendation also requires improving the energy efficiency skills of construction workers, technical energy advisors, and architects. The use of more innovative financial instruments might also increase the need for capacity building in municipalities, implementing agencies, and local banks.

High quality and continuous technical support throughout the programme participation enable high technical standards, higher savings, and possibly a faster adaptation to the newly installed technology. Nonstandard measures should be accompanied by mandatory energy audits and the setup of an energy roadmap for the building. This technical advice can be provided by certifying private sector actors, as is done in the NGS programme in the Czech Republic.¹²

All renovation measures could be subject to random unannounced onsite inspections by the implementing agency (i.e. the agency facilitating the support scheme or a trusted partner). The construction company conducting the renovation should personally vouch for the correct implementation of all measures according to the relevant rules and standards, which will make construction companies personally liable if the renovations are not up to the agreed upon standard. Such a rule would need to be monitored to highlight possible adverse effects as early as possible.

Furthermore, schemes should incentivise the implementation of energy efficiency measures with general construction measures. Between 2012 and 2016, it is estimated that while around 14% of the total residential floor area within the EU28 was subject of non-energy renovation measures, only around 4% were subject to at least light energy efficiency renovation measures (Ipsos, Guidehouse, 2019). These figures indicate a missed chance to implement much needed energy efficiency measures. They further provide an opportunity to market the increased health and comfort benefits to consumers or the increased property value for homeowners, which might be more highly valued than energy efficiency alone.

Grants or loans: The golden rule of grant and loan schemes is to keep them simple, lean, and flexible, making programmes attractive to potential applicants. Any grant and loan scheme running through the 2020s should be in-line with the taxonomy regulation, enabling broad financial sector participation.

Loan schemes alone can be inaccessible to low-income households, overburdening them financially. Grant schemes tend to be expensive and even have the possibility to crowd out

¹² Please see the case study on the NGS for more information or have a look at the NGS website: <https://www.novazelenausporam.cz/jak-na-to/seznam-specialistu/>

private financing; therefore, blending with other financial instruments is advisable. However, if a scheme also needs to be accessible to low-income households, grants are a suitable option because they require marginal own capital. Alternatively, a combination of grant and loan schemes seem to be able to perform well, such as KredEx in Estonia or KfW grants in Germany. Schemes need to be developed to offer a service that is legally connected to the house, not the property owner.

In the short and medium term, it is important to link the amount of the grant to the amount of energy saved, thus incentivising deeper renovations. If the conditionality of support on (actual) energy saved increases the uncertainty for investors, it needs to be monitored and possibly controlled for. Allowing private banks insight in energy performance before the renovation as well as an uniform and reliable estimate of the energy savings potential of the renovation based on, for example, access to the EPC data could help them assess how much money can be lent.

Guarantees: Guarantees for energy efficiency measures should enable compliance with the taxonomy requirements (i.e. should only be given to deep renovations) to facilitate long-term bankability and financial sector involvement.

EPCs: For large multifamily apartment buildings across Europe that often have a fragmented ownership structure, EPCs financing renovation measures seem a suitable financial tool. Some private initiatives in Eastern Europe such as LABEEF have shown use cases that can be implemented in other cities across Europe.

7.3.1 Conclusion

Member States should provide clear and comparable standards for all their programmes, which should be easy to use and have straightforward benefits. To this end, the sustainable finance taxonomy should serve as a minimum standard. Financial sector involvement can speed the upscaling of a programme. Therefore, programmes must adhere to all EU taxonomy regulations on energy efficiency. Furthermore, programmes should be externally evaluated on both process and impact.

8. Bibliography

8.1 Summary

European Commission (2020). Support from the EU budget to unlock investment into building renovation under the Renovation Wave (COM (2020) 662 final)

8.2 Case studies

8.2.1 LABEEF, Latvia

ALTUM. (2019, 12 17). *About the Program*. Retrieved from altum.lv: <https://www.altum.lv/lv/pakalpojumi/maju-energoefektivitate/daudzdzivoklu-maju-energoefektivitate-pamatinformacija/par-programmu/>

EBRD. (2017, 02 24). *EBRD supports innovative energy efficiency in Latvia*. Retrieved 12 18, 2019, from ebrd.com: <https://www.ebrd.com/news/2017/ebrd-supports-innovative-energy-efficiency-in-latvia.html>

- EC. (2019). *Report on the progress achieved in 2016 towards national energy efficiency targets for the year 2020 in accordance with Article 24(1) and Part 1 of Annex XIV to Directive 2012/27/EU*. Brussels: European Commission. Retrieved from https://ec.europa.eu/energy/sites/ener/files/documents/lv_annual_report_2019_en.pdf
- Eurostat. (2019, 12 10). *Complete Energy Balances*. Retrieved from [ec.europa.eu/eurostat: https://ec.europa.eu/eurostat/web/energy/data/database](https://ec.europa.eu/eurostat/web/energy/data/database)
- Ipsos; Navigant. (2019). *Comprehensive study of building renovation activities and the uptake of nearly zero-energy buildings in the EU*. Brussels: European Commission. Retrieved from <https://ec.europa.eu/energy/en/studies/comprehensive-study-building-energy-renovation-activities-and-uptake-nearly-zero-energy>
- Irrek, W., Bertoldi, P., Labanca, N., & Suerkemper, F. (2013). ESCOs for residential buildings: market situation in the European Union and policy recommendations. *European Council for an Energy Efficient Economy* (pp. 1339 - 1347). ECEEE.
- Jörling, K., & Schäfer, M. (2018). *LABEEF in Latvia*. Berlin: BEACON.
- JRC. (2017). *Energy Service Companies in the EU*. Brussels: JRC Science for Policy Report.
- Miezis, M., Zvaigznītis, K., Stancioff, N., & Soeftestad, L. (2016). Climate Change and Buildings Energy Efficiency – the Key Role of Residents. *Environmental and Climate Technologies*, 17.
- Odyssee-Mure. (2020, 02 12). *Latvia Profile*. Retrieved from [www.odyssee-mure.eu/: https://www.odyssee-mure.eu/publications/efficiency-trends-policies-profiles/latvia.html](https://www.odyssee-mure.eu/publications/efficiency-trends-policies-profiles/latvia.html)
- Pittini, A., & Laino, E. (2011). *Housing Europe Review 2012*. Brussels: CECODHAS Housing Europe's Observatory.
- Shnapp, S., Sitjà, R., & Laustsen, J. (2013). *What is a deep renovation measure?* Global Buildings Performance Network GBPN.
- Stancioff, N. (2019, October). Green Buildings - Scalable Financial Instrument - Delivering a European Building Energy Efficiency Facility. Zagreb: Funding for Future.
- Stancioff, N. (2020, 01 22). Director Funding for Future. (M. Jakob, Interviewer)

8.2.2 Flemish Revolving Energy Fund, Belgium

The Energiebesluit van 19 November 2010. Retrieved from: <https://codex.vlaanderen.be/Zoeken/Document.aspx?DID=1019755¶m=inhoud>

The Energiebesluit van 19 November 2010. Article 1.1.1, 7° definition of protected consumer (= entitled to the social tariff for gas and electricity); Retrieved from: <https://codex.vlaanderen.be/Zoeken/Document.aspx?DID=1019755¶m=inhoud>

BPIE/Buildings 2030. Building 4 People: Quantifying the impact of a better indoor environment in schools, offices and hospitals. Retrieved from: http://bpie.eu/wp-content/uploads/2018/12/policy-paper_031218.pdf

Presentation by Roel Vermeiren. Flemish Energy Agency. CA IV EED Plenary Meeting Helsinki.

8.2.3 KredEx, Estonia

European Commission. (2018). *European Construction Sector Observatory*.

CITYNVEST project's report. *KredEx Revolving Fund for energy efficiency in apartment buildings*.

KredEx. (2018). *Fund KredEx annual report 2018*.

Suu Laurie. (2016). *Financing housing in Estonia*.

Kurnitski Jarek. (2017). *Estonian KredEx renovation grant programme experience*.

Kalle Kuusk, Targo Kalamees. (2016). *Estonian grant scheme for renovating apartment buildings, 4 case studies, Estonia*.

8.2.4 JESSICA 2, Poland

BPIE (2018). *Financing renovation of buildings in Poland, an overview of public funding allocation for the renovation of buildings in Poland*. Retrieved from: <http://bpie.eu/wp-content/uploads/2018/06/merged-1.pdf>

BPIE, Instytut Ekonomii Srodowiska, KAPE and Narodowa Agencja Poszanowania Energii S.A. in cooperation with PWC (2015): *Buildings modernization Strategy: Roadmap 2050*. Retrieved from: <http://bpie.eu/wp-content/uploads/2015/10/BuildingsModernisationStrategy2050ENsummary.pdf>

BPIE (2016): *Financing building energy performance improvement in Poland*. Retrieved from: http://bpie.eu/wp-content/uploads/2016/01/BPIE_Financing-building-energy-in-Poland_EN.pdf

Eurostat: *Distribution of population by tenure status, 2017*. Retrieved from https://ec.europa.eu/eurostat/statistics-explained/images/0/00/Fig18_2_1.png

Worlddata; *Energy consumption in Poland*. Retrieved from <https://www.worlddata.info/europe/poland/energy-consumption.php>

Odyssee-Mure/Enerdata; *Poland profile*. Retrieved from <https://www.odyssee-mure.eu/publications/efficiency-trends-policies-profiles/poland.html#buildings>
<https://countrymeters.info/en/Poland>

8.2.5 NGS Programme, Czech Republic

EC. (2019). *Report on the progress achieved in 2016 towards national energy efficiency targets for the year 2020 in accordance with Article 24(1) and Part 1 of Annex XIV to Directive 2012/27/EU*. Brussels: European Commission. Retrieved from https://ec.europa.eu/energy/sites/ener/files/documents/lv_annual_report_2019_en.pdf

European Commission. (2017, 10 05). *Roundtable on Finance for Energy Efficiency in the Czech Republic*. Retrieved from [ec.europa.eu/https://ec.europa.eu/energy/sites/ener/files/documents/prague_roundtable_en_proceedings_final.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/prague_roundtable_en_proceedings_final.pdf)

Eurostat. (2019, 12 10). *Complete Energy Balances*. Retrieved from [ec.europa.eu/eurostat/https://ec.europa.eu/eurostat/web/energy/data/database](https://ec.europa.eu/eurostat/web/energy/data/database)

Hrbek, J. (2019, 01 16). Section Manager, SFZP. (M. Jakob, Interviewer)

Inherit. (2018). *Green Savings and New Green Savings - governmental subsidy schemes*. Brussels: Inherit.

Ipsos; Navigant. (2019). *Comprehensive study of building renovation activities and the uptake of nearly zero-energy buildings in the EU*. Brussels: European Commission.

- Retrieved from <https://ec.europa.eu/energy/en/studies/comprehensive-study-building-energy-renovation-activities-and-uptake-nearly-zero-energy>
- Irrek, W., Bertoldi, P., Labanca, N., & Suerkemper, F. (2013). ESCOs for residential buildings: market situation in the European Union and policy recommendations. *European Council for an Energy Efficient Economy* (pp. 1339 - 1347). ECEEE.
- JRC. (2017). *Energy Service Companies in the EU*. Brussels: JRC Science for Policy Report.
- Miezis, M., Zvaigznītis, K., Stancioff, N., & Soeftestad, L. (2016). Climate Change and Buildings Energy Efficiency – the Key Role of Residents. *Environmental and Climate Technologies*, 17.
- Ministry of Environment of the Czech Republic. (2017, 04 27). Czech experiences with renovations of housing in the frame of the New Green Savings Programme. Prague. Retrieved from https://ec.europa.eu/energy/sites/ener/files/documents/3_jan_kriz_seif_prague_27-04-17.pdf
- MIT. (2017). *Aktualizace Národního akčního plánu energetické účinnosti ČR*. Prague: Ministry of Industry and Trade of the Czech Republic. Retrieved from https://www.mpo.cz/assets/cz/energetika/energeticka-ucinnost/strategicke-dokumenty/2017/11/_17_III_Aktualizace-NAPEE-2016_vlada_final.pdf
- MIT. (2017). *Update of the National Energy Efficiency Action Plan of the Czech Republic (NEEAP)*. Ministry of Industry and Trade. Prague: Ministry of Industry and Trade.
- MRD. (2019). *Housing in the Czech Republic in Figures (Augsut 2019)*. Prague: Ministry of Regional Development of the Czech Republic. Retrieved 12 12, 2019, from <https://www.mmr.cz/getmedia/f0f903f3-ca5b-4b7f-b7a7-43d228a60f58/BvCZ-online-AJ.pdf.aspx?ext=.pdf>
- MURE. (2018, 03 26). *CZ25: New Green Savings Programme 2014-2020*. Retrieved from <http://www.measures-odyssee-mure.eu/>: http://www.measures-odyssee-mure.eu/public/mure_pdf/household/CZ25.PDF
- Pittini, A., & Laino, E. (2011). *Housing Europe Review 2012*. Brussels: CECODHAS Housing Europe's Observatory.
- Plecáková, Š., & Seidler, J. (2019, 04 09). *Czech Republic's housing structure*. Retrieved 12 16, 2019, from think.ing.com: <https://think.ing.com/articles/the-owner-structure-of-housing-in-the-czech-republic/>
- SFZP. (2019, 12 02). *New green savings*. Retrieved from www.sfzp.cz/: <https://www.sfzp.cz/dotace-a-pujcky/nova-zelena-usporam/>
- SFZP. (2019, 12 02). *Step by Step*. Retrieved from <https://www.novazelenausporam.cz/>: <https://www.novazelenausporam.cz/jak-na-to/krok-za-krokem/>
- SFZP. (2020, 02 12). *New Green Savings Programme*. Retrieved from www.sfzp.cz/: <https://www.sfzp.cz/en/administered-programmes/new-green-savings-programme/>
- SFZP. (2020, 02 12). *About the New Green Savings Programme*. Retrieved from www.novazelenausporam.cz/: <https://www.novazelenausporam.cz/about-the-new-green-savings-programme/>
- Shnapp, S., Sitjà, R., & Laustsen, J. (2013). *What is a deep renovation measure?* Global Buildings Performance Network GBPN.
- Sochor, V. (2020, 03 19). Director of Department of Energy Efficiency and Savings. (M. Jakob, Interviewer)
- von Manteuffel, B., & Dinges, K. (2018). *New Green in Savings Programme (NGIS) in the Czech Republic*. Berlin: BEACON.
- Zahradník, P., Karásek, J., & Zuzana, Š. (2012). *The challenges, dynamics and activities in the building sector and its energy demand in the Czech Republic*. Prague: ENTRANZE.

8.3 Policy recommendations

Economidou, Marina; Todeschi, Valeria; Bertoldi, Paolo (2019): *Accelerating energy renovation investments in buildings. Financial and fiscal instruments across the EU*. Luxembourg: Publications Office of the European Union (JRC Science for Policy Report, 29890).

Economidou, Marina; Bertoldi, Paolo; Boza-Kiss, Benigna; Palermo, Valentina (2019): *How to finance the renovation of residential buildings: innovative financing instruments*. Retrieved from https://www.eceee.org/library/conference_proceedings/eceee_Summer_Studies/2019/7-make-buildings-policies-great-again/how-to-finance-the-renovation-of-residential-buildings-innovative-financing-instruments/2019/7-302-19_Bertoldi.pdf/

Economidou, Marina; Todeschi, Valeria; Bertoldi, Paolo (2020): *Presentation on How to finance the renovation of residential buildings: innovative financing instruments*. Joint Research Centre.

Energy efficient Mortgages Action Plan (2021). Retrieved from <https://eemap.energyefficientmortgages.eu/>

European Commission (2018): *Smart finance for smart buildings: investing in energy efficiency in buildings*. Retrieved from https://ec.europa.eu/info/news/smart-finance-smart-buildings-investing-energy-efficiency-buildings-2018-feb-07_en

European Commission (2020a): *Supporting climate action through the EU budget*. Retrieved from https://ec.europa.eu/clima/policies/budget/mainstreaming_en

European Commission (2020b): *Sustainable finance: TEG final report on the EU taxonomy*. Retrieved from https://ec.europa.eu/knowledge4policy/publication/sustainable-finance-teg-final-report-eu-taxonomy_en

European Commission (2020c): *A Renovation Wave for Europe – greening our buildings, creating jobs, improving lives*. COM (2020) 662 final.

European Commission (2020d): *Renovation Wave. The European Green Deal*. doi:10.2833/797135

European Commission (2020e): *A New European Bauhaus*.

European Investment Bank (2021): *Financing energy efficiency*. Retrieved from https://ec.europa.eu/energy/topics/energy-efficiency/financing-energy-efficiency_en?redir=1#changing-the-risk-perception-of-financiers-and-investors

European Court of Auditors (2020): *Special Report: Energy efficiency in buildings: greater focus on cost-effectiveness still needed*. Retrieved from https://www.eca.europa.eu/Lists/ECADocuments/SR20_11/SR_Energy_efficiency_in_buildings_EN.pdf

EuroPACE (2021): *Integrated Home Renovation Platform*. Retrieved from <https://www.europace2020.eu/>

Ipsos; Guidehouse (2019): *Comprehensive study of building renovation activities and the uptake of nearly zero-energy buildings in the EU*. Brussels: European Commission. Retrieved from <https://ec.europa.eu/energy/en/studies/comprehensive-study-building->

energy-renovation-activities-and-uptake-nearly-zero-energy

GETTING IN TOUCH WITH THE EU

In person

All over the European Union there are hundreds of Europe Direct information centres. You can find the address of the centre nearest you at: https://europa.eu/european-union/contact_en

On the phone or by email

Europe Direct is a service that answers your questions about the European Union. You can contact this service:

- by freephone: 00 800 6 7 8 9 10 11 (certain operators may charge for these calls),
- at the following standard number: +32 22999696, or
- by email via: https://europa.eu/european-union/contact_en

FINDING INFORMATION ABOUT THE EU

Online

Information about the European Union in all the official languages of the EU is available on the Europa website at: https://europa.eu/european-union/index_en

EU publications

You can download or order free and priced EU publications from: <https://op.europa.eu/en/publications>. Multiple copies of free publications may be obtained by contacting Europe Direct or your local information centre (see https://europa.eu/european-union/contact_en).

EU law and related documents

For access to legal information from the EU, including all EU law since 1952 in all the official language versions, go to EUR-Lex at: <http://eur-lex.europa.eu>

Open data from the EU

The EU Open Data Portal (<http://data.europa.eu/euodp/en>) provides access to datasets from the EU. Data can be downloaded and reused for free, for both commercial and non-commercial purposes.

