



SMAFIN D.2.2 ENERGY EFFICIENCY BEST PRACTICES REPOSITORY

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The Report at a Glance

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Lead Beneficiary	EnEffect Consult		
Responsible Author(s)	Stanislav Andreev	e-mail	sandreev@eneffect.bg
Contributors	Kiki Papadopoulou (CRES), Elena Taxeri (CRES), Horia Petran (Pro-nZEB), Florentina Nanu (Pro-nZEB), Andrei Botis (RoGBC) Stanislav Andreev (EnEffectConsult), Hrvoje Maras (REGEA), Morana Plejić (REGEA), Damir Staničić (JSI)		
Reviewers	Morana Plejić (REGEA), Hrvoje Maras (REGEA), Florentina Nanu (Pro-nZEB), Alice Corovessi (INZEB), Kiki Papadopoulou (CRES)		
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ABSTRACT – EXECUTIVE SUMMARY

The SMAFIN Expanded project aims to enhance the structured dialogue and cooperation established during the SMAFIN project by gathering government, local and regional authorities, financial sector, Energy Service Companies (ESCOs), homeowners, industry sector, construction sector and small and medium-sized enterprises (SME), consumers and citizens associations to upgrade policy measures, develop or upgrade financial instruments and support the development of large-scale investment programmes that mobilise private finance for investments in energy efficiency across five EU countries: Bulgaria, Croatia, Greece, Romania, and Slovenia.

This report identifies and presents best practices for financing energy efficiency projects, highlighting financing schemes and models that have significantly contributed to sustainable investments in the building and SME sectors. National initiatives are systematically reviewed, presenting an overview of the most effective financial instruments and their replication potential across different countries.

The identified best practices will be shared with key national experts, policy makers and other stakeholders, and will serve as a basis for targeted discussions during the working groups and roundtables organised within the project. By incorporating lessons learned and recommendations already available from previous initiatives (SEIFs, SMAFIN, BeSMART), we will have the opportunity to work together with all participants at the events to support and accelerate the necessary actions/reforms that will ensure a more sustainable use of public funds and attract significant private investment in the targeted sectors (public, private and commercial buildings and SMEs).

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LIST OF ABBREVIATIONS AND ACRONYMS

Abbreviation	Full name
DBF	Design & Build & Finance
EE	Energy efficiency
EERSF	Energy Efficiency and Renewable Sources Fund
EIB	European Investment Bank
ELENA	European Local Energy Assistance
EnPC	Energy Performance Contracting
ESCO	Energy service company
ESIF	European Structural and Investment Fund
GHGM	Green Homes & Green Mortgage
FTE	Full-time equivalent
HBOR	Croatian national bank for reconstruction and development
PDS	Project Development Services
PIU	Project Implementation Unit
PP-EPS	Project Office for Energy Renovation of Buildings
PPA	Power Purchase Agreement
PPP	Public-Private Partnership
PV	Photovoltaic
PUI	Project Implementation Unit
RE	Renewable energy
RES	Renewable energy sources
RRF	Recover and Resilience Fund
SME	Small and Medium-sized Enterprises

1. INTRODUCTION

Investment in energy efficiency (EE) at the EU level continues to stagnate, although at least a doubling of investment is needed to meet the [Union's targets](#). Achieving these targets is crucial to reducing greenhouse gas emissions, increasing energy security, and reducing dependence on fossil fuels. Without a significant increase in funding, the EU risks falling short of its climate commitments and hindering progress towards a sustainable and resilient energy system. Policymakers must prioritise and incentivise energy efficiency to ensure that the necessary investments are made to support the green transition, paying particular attention to buildings and SMEs.

The purpose of this document is to present in detail a number of best practices for sustainable financing of energy efficiency and renewable energy projects from Bulgaria, Croatia, Greece, Romania and Slovenia. The need for it is driven by the fact that reviews of so-called "best practices" are very common, but often, these are small-scale initiatives that have not shown either sustainability over time or potential for replication. Therefore, the authors of the report, based on detailed analyses and pre-selected criteria, have identified only initiatives and tools that have proven themselves over time and could be successfully replicated in the respective countries and in other EU Member States despite the different regulatory frameworks. The main selection criteria were the scale of the individual initiatives and projects, their duration over time, the results achieved, and the possibility of attracting private financing.

Despite some successful practices, such as those shared in this report, they are not yet widespread and are applied sporadically by Member States, which indicates the necessity for further action. In Bulgaria, for example, the successful [EERSF](#) and [FLAG Fund](#), supporting energy efficiency projects in the public building stock, compete with the high intensity of grants for public authorities (close to 100%), while for residential buildings and industry, no sustainable models and instruments are currently observed. The technical assistance for renewable energy (RE) and building renovation projects in Croatia is a good example of supporting sustainable projects, but again, the main building stock, namely residential buildings, seems to remain a bit in the background. In the example of Greece, the renovation of residential buildings is supported through the Recovery and Resilience Mechanism, but although the continuation of the initiative is foreseen, the financial resources for this are not yet fully secured. The green mortgage in Romania is a successful product predominantly targeting the new buildings in the residential sector, but in the other sectors there are episodic programmes and projects, mostly launched based on temporarily available financial resources rather than sustainable initiatives that effectively attract private funds. The development of the EnPC market in Slovenia is a strong example of sustainable policies fostering good practices, but it seems that the focus remains primarily on public buildings.

The above does not mean that the five countries do not have instruments and initiatives covering all the sectors mentioned, but they are characterised by campaigns and the availability of free financial resources from various public sources rather than by sustainability and massive leveraging of private funds to achieve the ambitious goals set out in their strategy documents. It is also clear that one of the main challenges is the

renovation of the residential buildings, for which citizens need to be involved, and this requires much more decisive action within sustainable and predictable programmes supported by large-scale communication campaigns.

The document builds on top of a similar [report](#) developed within the SMAFIN Horizon 2020 project in 2021, selecting only the best of the best practices and supplementing the information with concrete recommendations for successful implementation.

TABLE 1: Overview of the identified best practices

No	Best practice	Beneficiary	Type of funding	Replication potential
Bulgaria				
1.	Energy Efficiency and Renewable Sources Fund	Public sector Private sector Commercial sector	Loans Guarantees Technical assistance	High
Croatia				
1.	ELENA Project: Maximal PhotoVoltaic for Croatia (PVMaX)	Private sector Public sector Commercial sector	Grants EnPC	High
2.	ELENA project: Sustainable Energy HBOR (SE HBOR)	Commercial sector	Grants Technical assistance	High
Greece				
1.	SAVING-EXOIKONOMO 2021	Residential buildings	Loans Grants	High
2.	PRODIGEE (Project development of integrated energy efficiency renovations)	Public sector	Grants EnPC ppp Technical assistance	High
Romania				
1.	Green Mortgage	Residential buildings	Loans Technical support	High

No	Best practice	Beneficiary	Type of funding	Replication potential
Slovenia				
1.	Financing deep renovation via EnPC and grants	Public sector	Grants EnPC	High

2. NATIONAL BEST PRACTICES

2.1 BULGARIA

2.1.1 ENERGY EFFICIENCY AND RENEWABLE SOURCES FUND

The [Energy Efficiency and Renewable Sources Fund](#) (EERSF or the Fund) is a legal entity established in accordance with the Bulgarian Energy Efficiency Act in 2004. EERSF manages the financial resources received by the Republic of Bulgaria from the Global Environment Facility through the International Bank for Reconstruction and Development and from other donors. EERSF is an independent legal entity separate from any governmental agency or institution, and it performs its activity in accordance with the current legislation framework, and the agreements with the major donors.

EERSF is structured as a self-sustainable commercial entity that concentrates its efforts on facilitating energy efficiency investments and promoting the development of a working energy efficiency market in Bulgaria. The Fund's main environmental objective is to support the identification, development and financing of viable energy efficiency projects, resulting in substantial reduction of greenhouse gases.

The Fund offers a variety of financial products, namely:

a) Loans and Cessions

Direct financing (with a fixed rate for the entire period and no additional conditions or fees) or bridge financing for EU programmes financing.

Cessions for corporate clients and ESCOs.

b) Guarantees

Portfolio guarantees:

- *ESCO portfolio guarantee* – to attract more ESCO companies into this business and to make ESCOs more comfortable by guaranteeing the risk of their counterparties – the project beneficiaries.

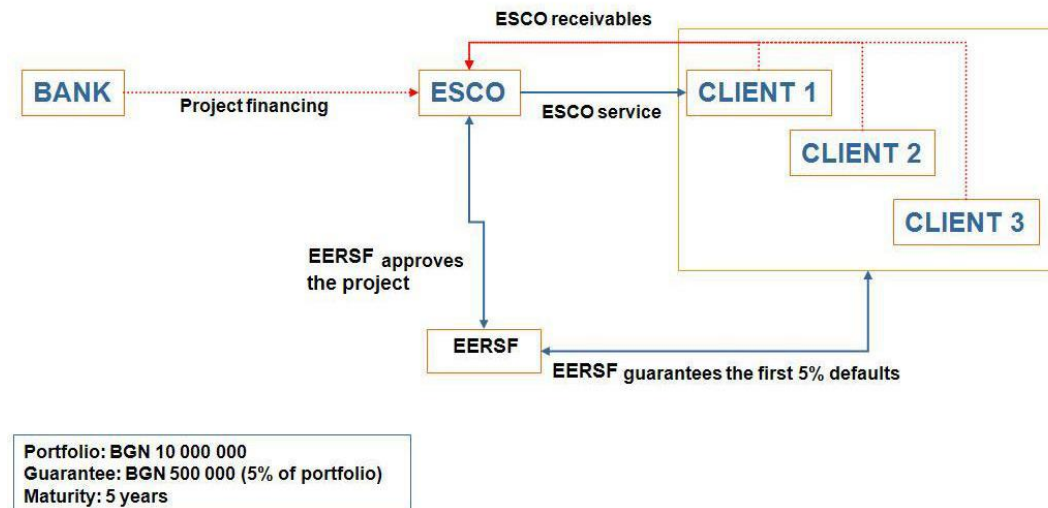


Figure 1: ESCO portfolio guarantees offered by EERSF

- *Residential portfolio guarantee* – to kick-start the market of EE investments in the residential sector, by providing market products that overcome the lack of legislation in the country.

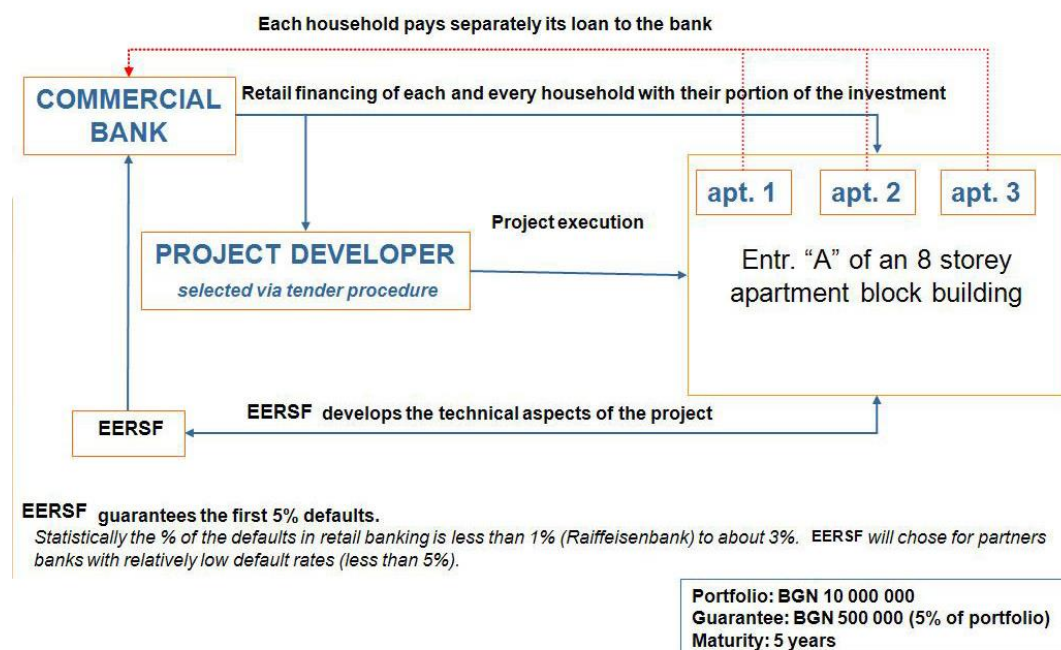


Figure 2: Residential portfolio guarantees offered by EERSF

c) Partial credit guarantees

- 80% on a “*pari passu*” basis
- 50% on a first-loss basis after the bank-creditor

In addition, all customers receive free technical advice in both the preparation and execution of the projects, ensuring their quality and the achievement of predetermined

savings. The Fund's technical experts verify the implementation of the activities during the construction works and after their completion.

Since its inception in 2005, EERSF has provided funding for over 215 projects divided into three main groups by type of client: municipalities (~50% of the projects), corporate (~38%), and others, incl. hospitals, universities, etc. (~12%). The total value of the supported projects is about EUR 50 million, which shows good efficiency considering the Fund's loan portfolio of EUR 5-6 million.

The results are even more impressive given the environment of strong competition from commercial banks and a market relying mainly on a high percentage of grant funding provided by a variety of programs supported by the EU Structural and Investment funds.

Finally, the instrument's sustainability is evidenced by the quality of the loan portfolio, which can hardly be matched by any commercial bank. More than 98% of the loans are regularly serviced, mainly due to the technical support provided by the Fund's experts during the planning and implementation phases, ensuring stable cash flows following the achievement of the envisaged energy savings.

The EERSF structure that has proved successful over the years and facilitates independent, transparent and efficient governance based on highly qualified expertise is presented hereafter:

General Donnor Assembly, who accepts the regulations on the operation, organization and activity of the Fund and elects and releases the members of the Management board. It consists of private individuals and legal entities who granted funds to the Fund.

The **Management board** is the managing body of the Fund. It consists of representatives from three Ministries, the Executive Director of the Sustainable Energy Development Agency, and five experts (one from the NGO sector, two in project funding, one in EE, and one in RES).

Chairman of the Management Board, who represents the Management Board in its relations with other bodies of the Fund and is elected for 1-year term.

Fund Manager, responsible for the entire day-to-day operation of the Fund and for implementation of the project cycle. Its main objective is to operate the Fund as a profit-oriented business in such a way that it promotes EE investments and helps a sustainable EE market develop in Bulgaria. The Fund Manager selects and applies the appropriate financing tools based on specific project circumstances and overall project portfolio management considerations.

The **Executive director** represents the Fund and is responsible for operational management. The contract with the Executive Director is concluded for 5 (five) years.

The Regulation on the Operation Organization and the Activities of the Fund can be found on the following [link](#).

2.2 CROATIA

2.2.1 MAXIMAL PHOTOVOLTAIC FOR CROATIA ([PVMax](#))



The PVMax project, supported by European Local Energy Assistance (ELENA) likely involves efforts to promote and finance the installation of photovoltaic solar systems in Croatia for private, public, and commercial buildings.

The ELENA-funded Project Development Services (PDS) will offer technical assistance in implementing a Renewable

Energy and Energy Efficiency Investment Programme in Croatia. The PDS, implemented by the North-West Croatia Regional Energy Agency (REGEA), aims to mobilize up to €87.90 million in investments. To enhance investment opportunities and prepare projects for financing, the PDS will offer comprehensive services, including technical consulting, financial consulting, and legal consulting.

This assistance is 100% funded, with 90% of the costs covered by the ELENA program grants under Horizon 2020, based on an agreement between REGEA and the European Investment Bank (ELENA-2019-144), and the remaining 10% funded by REGEA's own budget.

The PDS will be customized for different segments within the investment program:

- **Homeowners:** Develop a One Stop Shop platform for photovoltaic (PV) projects, assist regional authorities with subsidy programs, and collaborate with banks to offer tailored financial products.
- **Public and Commercial Buildings:** Screen over 5,000 buildings to identify the top 1,000 for PV installation, conduct feasibility studies, and facilitate partnerships for installation and financing.
- **Community-Owned PV Projects:** Support initiatives in multi-apartment or public buildings by providing technical, legal, and organizational assistance and overseeing project implementation.
- **Energy Efficiency Audits:** Conduct audits for selected buildings to optimize investment between energy efficiency measures and PV self-production and promote innovative contractual models combining Energy Supply and Performance Contracts.

The PVMax project faces **specific challenges** that can affect the timeline and successful implementation of PV installations. A key challenge is the potential delay in obtaining necessary approvals and connection offers from [HEP ODS](#) (the Croatian Electricity Distribution System Operator). Specifically:

- **Approval Delays:** The project timeline can be extended if clients experience prolonged waits for approvals from HEP ODS. This includes delays in receiving connection offers for solar power plants.

- **Regulatory Hurdles:** Navigating the regulatory requirements and ensuring compliance can pose significant hurdles, potentially causing further delays.
- **Coordination with Authorities:** Effective coordination with HEP ODS and other relevant authorities is crucial to mitigate delays and ensure smooth project progression.

Addressing these challenges requires proactive engagement with HEP ODS, continuous follow-up, and efficient project management to keep the project on track and mobilize investments effectively.

Additionally expected results of investments planned and the total estimated contributions are:

- **Energy Efficiency** – Annual total energy saved 1.05 GWh, representing a reduction of 19% compared to the baseline.
- **Renewable Energy** – Annual total of 115 GWh RE electricity generation.
- **CO2 reductions** – Annual total reductions of 29,348 CO₂ eq t.
- **Jobs retained or created** - in 900 Full-time equivalents.

Since the project's public call opening, REGEA has forged cooperation agreements with clients from both the private and public sectors to provide tailored support, be it technical, financial, and/or legal, for the development of integrated solar power plants at 676 locations. These plants boast a cumulative installed capacity of approximately 182.3 MWp.

Projects at these locations are progressing through various stages of implementation, contingent upon factors like commencement dates of construction processes. These timelines hinge on several factors, including the duration of project-technical documentation preparation, obtaining electro-energy consent, drafting tender documentation (primarily for the public sector), initiating public procurement, and meticulous contractor selection.

Currently, roughly 90 integrated solar power plants with a total installed capacity of around 20 MWp have been successfully completed and are operating permanently.

Conversely, at the project level, several clients from private and public sectors have inked contracts to construct around 50 integrated solar power plant projects. Upon completion, as per standardized contractual documentation, **these projects are expected to contribute to a total installed capacity of around 24 MWp.** The commissioning of these plants is anticipated **by the end of 2024**, contingent upon the scale and intricacy of execution.

Presently, approximately **33 public procurement processes** across various public sector representatives are underway, awaiting the evaluation of received offers, contractor selection, and contract signing for the construction of an equivalent number of integrated solar power plants, with a collective installed capacity of around 4 MWp.

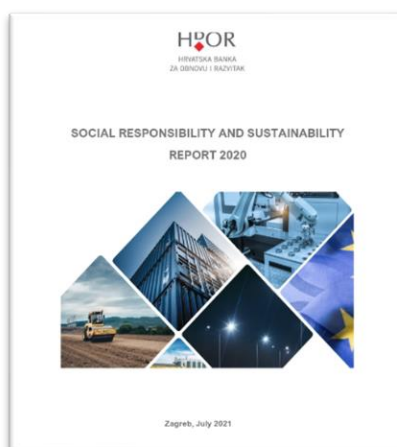
Regarding the execution model for solar power plant construction, the design-and-build model prevails among our clients, bolstered by our financial and legal counsel. Under this model, **clients contract the main project and execution of works under a single agreement.**

While the design-and-build model is predominant, private and public clients have also employed other models. These range from the traditional Build model, often due to tender conditions for which REGEA did not prepare main projects, to the alternative procurement model Design & Build & Finance (DBF) or **popularly known as PPA. In this model, bidders or contractors, besides designing the main project and executing works, also finance the entire process.** In return, **they sign a contract to sell** electrical energy at the client's location for 10, 15, or 20 years – depending on the agreed terms.

Market **replication is considered high** based on [EU Solar Energy Strategy](#) and [Commission efforts](#) to accelerate rooftops' vast and underutilized potential to produce clean energy.

2.2.2 SE HBOR (SUSTAINABLE ENERGY HBOR)

The European Green Deal aims to reduce the EU's energy needs by 32.5% by 2030. The plan will include comprehensive investments in all sectors, but the real challenge will be finding sources of financing for capital projects. There is no doubt that financial industry stakeholders will play a major role in creating financial instruments and technical assistance. As a main leader of the initiative, the European Investment Bank (EIB) has committed to allocating at least 50% of its financing to climate-friendly investments by 2025. Until 2020, out of a total lending of €77 billion, approximately 40% supported climate action and environmental sustainability. Croatian Bank for Reconstruction and Development (HBOR) was the first national bank to recognize the importance of financing energy efficiency and green transition for SMEs and local governments.



In the implementation plan of ELENA Sustainable Energy HBOR (SE HBOR) EIB has allocated over EUR 2 million to HBOR to assist Croatian businesses in accessing grants for energy efficiency enhancements. Additionally, municipalities were allowed to leverage this support for improvements to their street lighting infrastructure.

Under this program, HBOR facilitated eligible entities accessing grants totalling up to EUR 57.6 million, primarily from the EIB's ELENA initiative. To improve energy efficiency, the goal was to **empower Croatian businesses, especially those owning E and F rated commercial buildings.** HBOR guided these businesses in applying for EU and other grants to bolster energy efficiency or integrate renewable energy sources (RES).

Furthermore, the project aimed to achieve annual energy savings of up to 35 GWh and reduce CO₂ emissions. The program targeted direct impact on approximately 130,000 square meters of commercial space.

Within the [ELENA program implemented by HBOR](#), 100% of the costs of preparing investment projects by selected consultants are covered. Grants covered **90% of the costs of preparing project documentation** for investment projects in energy efficiency, renewable energy, and cleaner urban transport. The main success indicator was the

achievement of a multiplier of grant funds, where EUR 2 million of ELENA grant funds should lead to at least EUR 40 million worth of eligible investments.

Since the program's implementation in 2020, documentation for 58 projects has been approved. By December 31, 2021, documentation for 34 projects had been prepared, financed by ELENA grant funds exceeding HRK 3.6 million (477,800 EUR). Multiple entities prepared projects to enhance energy efficiency in various sectors, with ELENA technical assistance available until May 1, 2023.

Additionally expected results of investments planned, and the total estimated contributions were:

- Energy Efficiency – Annual total energy saved 35 GWh.
- Renewable Energy – Annual total 1 GWh, of which: 1 GWh RE electricity generation.
- CO₂ reductions – Annual total reductions of 8,600 tCO₂eq

Market replication potential is considered high, because the [EU Taxonomy Regulation](#) entered into force on July 2020 presenting renewed EU sustainable finance strategy and implementation of the action plan on financing sustainable growth. The EU taxonomy should promote transparency and investment comparison regarding sustainability. According to the EU Taxonomy in the real estate market, one should consider the framework when engaging in the [following activities](#): Construction of new buildings; Renovation of existing buildings; Installation, maintenance, and repair of energy efficiency equipment; Installation, maintenance and repair of charging stations for electric vehicles in buildings (and parking); Installation, maintenance and repair of instruments and devices for measuring, regulation and controlling energy performance of buildings; Installation, maintenance and repair of renewable energy technologies; Acquisition and ownership of buildings.

For each sector portfolio of buildings, EU Taxonomy implementation leads to capital investments and thus to investment needs. The role of the financial sector in finding solutions for emerging needs will increase, and it is expected that the project can be replicated on the products of development banks and commercial banks around EU.

EU Taxonomy Regulation sets rules and harmonised requirements at a European level with the intention to prevent barriers from forming and remove existing barriers related to financing sustainable activities. Furthermore, EU's legislative bodies have adopted directives and regulations to re-direct capital to more sustainable economic activities in the form of green (or sustainable) finance. For the financial sector, it means encouragement to "push" loans, investments, and financial instruments toward "green" or "sustainability-linked" projects. Therefore, an EU developed a harmonized approach to project financing, with clearly defined goals and results. This shows that there are no barriers to replicating this model, but it can serve as an example of good practice for other financial market participants in the EU.

2.3 GREECE

2.3.1 SAVING-EXOIKONOMO 2021

The "[SAVING-EXOIKONOMO 2021](#)" Program, supporting energy renovation of homes, with a total budget of 632 million euros, adapted and improved the previous financial scheme, aiming to maximise the benefits for citizens by increasing the number of the households that are eligible to participate with increased benefits for vulnerable and low income citizens, simplifying the certification of interventions and activating the market by mobilising private capital to finance the required interventions.

The Program provides incentives (between 40% and 75%, depending on household income) for energy-saving interventions in the domestic building sector, with the aim of reducing energy needs and the consumption of conventional fuels. It includes five categories of incentives, in which the Beneficiaries are included according to their income. The Program is funded by the Recovery and Resilience Fund and provides incentives through a grant (direct aid) and a loan interest subsidy. In total, the beneficiaries of the Program are 87, 578 households and the budget amounts to 1.2 billion euros.

The financial instrument is a partial subsidy and an interest rate subsidy on the loan. It is considered best practice in Greece because it succeeded in leveraging private money and funds from Greece's recovery and resilience plan.

In the framework of the revision of the National Energy and Climate Plan, of which an updated version will be submitted at the end of June 2024 to EC, a reduction of final energy consumption by 11.9% is proposed for the period 2020-2030. This is planned to be achieved by the energy upgrading of buildings at an annual rate of 58 000 units/year during the period 2020-2025, which is projected to increase to 68 000 units/year during the next five years 2025-2030. The continuation of the SAVING-EXOIKONOMO program is expected to contribute to achieving these goals. Besides the replication potential at the national level, the Program is considered a successful tool to be transferred as a valuable experience in other EU countries with similar needs.

It is important to note that the published series of calls for proposals are continuously updated based on stakeholder feedback and current national legislation. Each programme cycle adapts to new conditions shaped by the country's climate data and EU directives, addressing contemporary imperatives such as citizens' needs, climate change, digitalisation, and new technologies. Each implementation refines the previous financing model to maximize benefits for citizens by increasing participation. This is achieved by simplifying intervention certification and mobilizing private capital to finance necessary actions. Additionally, it is recommended to keep procedures simple, inform citizens well in advance, and ensure timely payments according to the schedule to avoid unexpected market disruptions.

2.3.2 PRODIGEE (PROJECT DEVELOPMENT OF INTEGRATED ENERGY EFFICIENCY RENOVATIONS)

The [PRODIGEE](#) project, supported by [ELENA](#), aims to establish a Project Implementation Unit (PIU) and targets large-scale EE and RES Development across Greece. Technical

Assistance will help the Greek public authorities prioritize, mature, and develop a series of energy initiatives for the public sector in Greece.

The Ministry of Development and Investments intends to use ELENA primarily to support the implementation of the ELECTRA Programme, in which the Hellenic Republic intends to invest over EUR 700 m in energy efficiency investments.

Most of the investments will be implemented through “standard” construction contracts. Where feasible, the investments will be implemented through Energy Performance Contracting (EnPC) / ESCOs or Public Private Partnerships (PPP) schemes where private capital is used to co-fund public infrastructure projects. As mentioned above, the funding will be blended with the ELECTRA Programme and grants from the European Structural and Investment Funds (ESIF), the Recover and Resilience Fund (RRF) and the Green Fund. The investment programme consists of 3 schemes addressing the implementation of energy efficiency retrofits in public buildings (hospitals, health centres and administrative buildings), installing PV panels on those buildings and energy efficiency measures in the regional and municipal street lighting systems. Investing in public buildings should improve the EE of over 136,000 sqm and approx. 18 buildings.

This ongoing project is part of the best practices based on its concept that includes blending of financing and promoting schemes such as EnPC/ESCOs. There is potential for replication, given the national goals that need to be achieved.

2.4 ROMANIA

2.4.1 GREEN HOMES AND GREEN MORTGAGE PROGRAM

The Green Homes & Green Mortgage (GHGM) program is a specialized home loan offered by selected banks to incentivize purchasing certified residential projects, achieving exemplary energy and other green performance. Certification programs – such as the Green Homes certified by RoGBC program (and other holistic and credible residential certifications present on the market) - allow residential investors and developers to distinguish their projects by emphasizing quality and environmental performance. Financial institutions reduce mortgage default risk and increase home values over time by offering Green Mortgage (GM) tied to certified Green Homes, empowering developers to invest in better design and construction quality. This initiative cultivates a culture of sensible borrowing and investment in environmentally responsible residential projects in Romania, generating financial, social, and environmental benefits. Of critical importance is the role of RoGBC and all partners emphasize the importance of citizens considering the “total cost of monthly ownership” rather than just the sales price of the home. This demonstrates exemplary green homes are less expensive from the first month of owning the home when considering the mortgage payment and lower energy and other costs paid monthly.

The program utilizes 100% private sector funds. The developer pays for the certification, and the bank offers a discounted green mortgage and maintains profitability based on its reduced risk. Investment in exemplary green building performance is made by a combination of developer finance, the retail mortgage, and the downpayment by the homebuyer.

The Green Mortgage (GM) was first conceived in 2007 but was delayed by the global financial crisis around that time, which affected, particularly, the mortgage market. In 2012, a partnership with Raiffeisen Bank Romania was signed and agreements to certify residential projects with developers were formed. In 2024, there are now partnerships with eight banks—both international banking groups and independents—and demonstrated success with replication in new markets. More than 2 billion euros worth of projects have been certified or have signed agreements with developers to certify.

To ensure effectiveness and widespread adoption, it is necessary to follow basic principles and practices, including:

- **Partnership Formation:** Establish partnerships between certifiers, banks, and government bodies to jointly administer and promote the Green Mortgage (GM) program. This collaboration ensures streamlined processes and consistent implementation.
- **Policy Alignment:** Align Green Mortgage (GM) initiatives with existing and forthcoming government directives on energy efficiency and sustainable construction to leverage policy support and ensure compliance with national goals.
- **Public Awareness Campaigns:** Launch public awareness campaigns to educate consumers about the benefits of Green Mortgage (GM) and Green Homes. Highlight how energy efficiency and environmental performance contribute to long-term cost savings and improved living conditions.
- **Continuous Monitoring and Evaluation:** Implement mechanisms to monitor the performance and impact of Green Mortgage (GM) programs. This includes tracking energy savings, default rates, and overall market uptake to inform program adjustments and improvements over time.

By implementing these recommendations, Romania is effectively using GHGM programs to promote sustainable housing, reduce energy consumption and increase the sustainability of the residential property market. More than 15,000 units have been pre-certified or certified up to date.

Following the national success, the Romania Green Building Council, together with 17 partners and with support from Horizon 2020 and LIFE programmes, created a successful, international green finance program named [SMARTER Finance for Families](#). This was followed by a second project [Smarter Finance for EU](#) (these two projects are collectively referred to as “SMARTER” going forward). SMARTER replicated a successful GHGM program to 15 new countries, addresses barriers and brings green innovation with relevant research and cluster formation, adapts essential tools for administration and communication, and effectively expands the collection of actual energy and financial performance to improve risk analysis with local data.

Capacity building for all essential stakeholders in the process is delivered by RoGBC and other in-country and international experts in the form of a “Green Homes Professional Accreditation”. SMARTER is now working with the consortium partners to develop tailored training for green finance focused on the banking and investment sectors tentatively titled the “Green Homes Accredited Finance Professional” lifelong learning program.

SMARTER delivers an important component of “[Hybrid Green Finance for Vulnerable Persons](#)” to mitigate energy poverty and to assist municipalities and other responsible public entities with the challenging task of assessing building projects for their green performance. Additional efforts are made to leverage the available public financial support with private financing via green mortgages issued from partner banks. Events, training courses, and the Let’s Build Green campaign have trained over 40 municipal representatives with a particular focus on Ukraine and other countries historically (and often currently) dependent on the importation of Russian fossil fuel.

Analyses show that the key to the success of such a product is the effective collaboration between the certifier (who performs the technical assessments and verifies the Green Home) and the partner banks (who provide the Green Mortgage (GM)s). The program is open to all banks offering home mortgages, with the condition they offer their best conditions for a retail green mortgage only for homes that adhere to the specified criteria. Additionally, they should commit to offering substantial interest rate reductions consistent throughout the mortgage's term, reflecting the reduced default risk and increased long-term asset value of Green Mortgage (GM) eligible homes.

Figure 3 below presents more details on how green homes, green mortgages, and construction and renovation loans work.

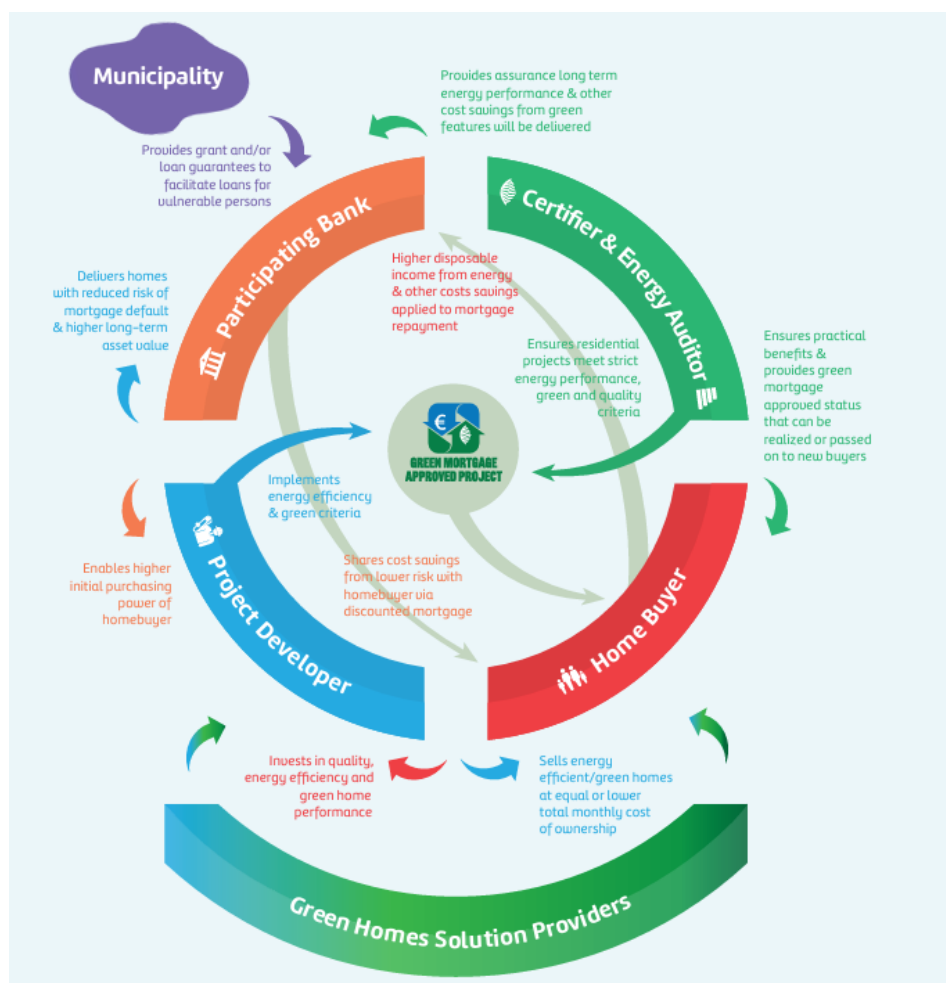


Figure 3: Responsibilities and benefits of stakeholders

2.5 SLOVENIA

2.5.1 FINANCING DEEP RENOVATIONS VIA ENERGY PERFORMANCE CONTRACTING AND GRANTS

In the 2014-2020 programming period, Slovenia embarked on comprehensive renovations of public sector buildings. A financing scheme was developed, comprising 51% private financing (via equity capital or debt financing) through Energy Performance Contracting (EnPC), up to 9% state-budget financing, and for deep renovation purposes, 40–49% of financing costs covered by investment grants funded by the Cohesion Fund. The public sector deep renovation program is overseen by the Ministry of Environment, Climate, and Energy, and the combination of financial instruments and grants constitutes a single financing operation. The financing scheme was successfully implemented and will continue into the 2021-2027 programming period.

EnPC serves as a key renovation mechanism for achieving ambitious energy-saving targets within a tight timeframe, providing performance guarantees and technical capacity, decreasing risks, and mobilizing private sector financing. Slovenia has a well-developed EnPC market characterized by high-quality projects, standardized business models, and contracts. EnPC providers, mainly small and medium companies, finance their projects through equity financing (both national and EU), forfaiting (EU), and debt financing. However, they still encounter difficulties in securing long-term financing from banks.

There were **51 EnPC projects** implemented in the public sector in the programming period 2016-2021, and more than 696,000 m² were renovated in the framework of the public buildings deep renovation programme (Table 2). However, these projects covered almost three-quarters of the net floor area of all buildings renovated. The size of the EnPC market in Slovenia in that period was worth more than EUR 160 million, considering the conservative assumption that 90 % of EnPC investments were allocated in the public sector.

The ratio of subsidies granted to investments stimulated has also improved significantly over the period, decreasing from 0.62 in 2014 to 0.34 by 2022.

TABLE 2: Public sector deep renovations in the programming period 2016-2021

Year	No. of projects	No. of buildings renovated	Final energy savings [MWh/a]	Floor area renovated [m²]	Renewable energy produced [kWh/a]	Emissions savings [t CO ₂ /a]	Renovation investment grants [K EUR]	Total investment costs [K EUR]	Eligible costs [K EUR]
EnPC projects									
2017	1	1	209	2 105	0	37	325	1 237	81
2018	10	67	11 625	141 865	2 743	3 575	9 479	24 431	23 697
2019	11	58	13 169	170 871	4 922	2 894	10 964	28 166	27 411
2020	6	34	9 908	110 385	2 921	2 326	8 540	23 304	21 351
2021	4	19	4 505	51 929	2 290	1 085	3 882	9 001	8 954
2022	8	33	9 071	122 015	4 098	2 168	12 370	27 629	27 007
2023	11	50	9 108	96 920	2 692	2 141	14 539	30 770	30 524
Total	51	262	57 595	696 091	19 665	14 225	60 100	144 537	139 756
All projects									
2016-2021	142	455	87 226	1 095 705	26 297	22 855	114 357	317 348	259 721

The National Energy Efficiency Action Plan (2012) and the Long-term Strategy for Mobilising Investments in the Energy Renovation of Building Stock (2015) strategically established a stimulating support environment for the intensive uptake of the EnPC, which was further developed in the National Energy and Climate Plan (2021) and Long-Term Renovation Strategy (2021).

EnPC market: status, size and trends

The Slovenian EnPC market has been developed since 2002. Its status can be described as **developing but mature in the public sector**. The EnPC market has been experiencing continuous growth since 2012 and a major expansion in 2014-2021 programming period, driven by the success of an established **public buildings deep energy renovation programme in the framework of the Operational Programme for the Implementation of the EU Cohesion Policy in the period 2014 – 2020**.

The programme provides **standardised EnPC** project development processes, procurement requirements and model contracts, and up to 40-49 % EU grant (Cohesion Fund) financing to be blended with 51 % of private financing, at least. The standardised processes and supporting environment for EnPC co-financing have been tested and optimised through the implementation of three demonstration EnPC projects. The programme was launched with the establishment of a [Project Office for Energy Renovation of Buildings](#) (PP-EPS) in 2015. Public buildings deep renovation projects have to be carried out in the form of a **public-private partnership (PPP)** based on the EnPC

model, in the case of expressed interest of EnPC provider(s), or otherwise through a public procurement.

In order to fulfil provisions of Article 16 of the Energy Efficiency Directive regarding the availability of qualification, accreditation and certification schemes, the MoI registered energy efficiency service providers with a record of realised EnPC projects with guaranteed energy savings. There are [eight registered EnPC providers](#) and two of them dominate the EnPC supply market which is considered not to be competitive. It is estimated that there are up to 10 EnPC facilitators (private consultancy companies, local energy agencies, public bodies), out of which five provided ELENA technical support. The EnPC facilitators are not accredited yet.

EnPC key enabling factors

The following EnPC key enabling factors (Figure 4) were in place underpinning EnPC development:

- Policy and Legislation
 - Commitment of the authorities (Ministry of Infrastructure, Ministry of Finance and Government Office for Development and European Cohesion Policy of the Republic of Slovenia) to fulfilling targets established in long-term renovation strategies and implementing EnPC measures (5 directly related and 4 indirectly related to EnPC)
 - Of-balance sheet treatment of EnPC implemented as service concession under [Public Private Partnership Act](#)
 - EnPC as the default option - obligatory EnPC test for deep renovation investments of public sector buildings
 - Leadership and governance – EnPC implementation led by the PP-EPS
- Financing
 - National financing instruments (EU grants blended with private capital; energy efficiency loans to public bodies or ESCOs; EnPC providers' equity and debt financing)
 - International financing instruments used (loans to EnPC providers; EnPC equity providers financing; forfeiting; bridge financing)
- Pipeline of ELENA projects
 - Standardised implementation processes and documentation
 - European Local Energy Assistance (ELENA) – leverage factor of at least 20

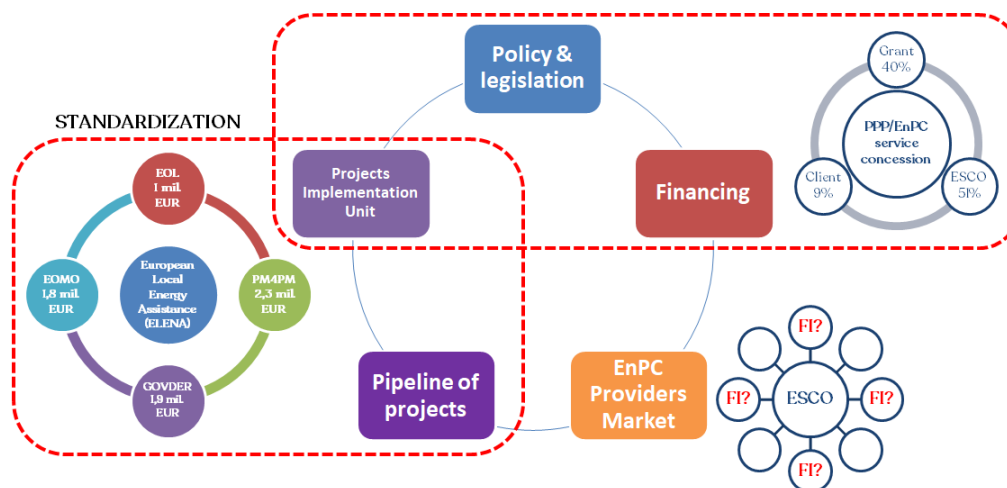


Figure 4: EnPC key enabling factors

EnPC model and projects characteristics

Typical EnPC projects in Slovenia have a capital outlay of EUR 1-5 million and a contract length of 15 years due to prevailing buildings' deep energy renovation. The EnPC model contract for the public sector is provided for the off-balance treatment in line with the [Eurostat Guidance Note](#) on the recording of EnPC in government accounts. Measurement and verification processes are used to reconcile performance and guaranteed savings. All relevant EnPC and ESCO providers and facilitators signed the [European Code of Conduct for EnPC](#), which defined EnPC key quality benchmarks and provided valuable information for clients.

Analysis of cost-effectiveness and energy efficiency performance of the EnPC and "Public Procurement"¹ renovation projects in the public sector for the period 2016-2019 show that EnPC projects achieve better results than public procurement ones, i.e. 14 % **higher final energy savings** and 27 % **lower renovation costs**.

It is noted that, due to public clients' lack of EnPC awareness, understanding and implementing capacity, selecting a private partner following a PPP competitive dialogue procedure requires, as a general rule, more time than selecting contractors for public procurement operations. However, data of all completed EnPC projects in the central government and wider public sector show that the duration of the operations, from the decision on EU grant support to the implementation of all energy efficiency measures, are practically the same: 551 days for EnPC projects and 563 days for "Public Procurement" projects. When implementation duration data of projects which significantly stand out are excluded from the analysis, the implementation time for EnPC projects is 172 days or almost six months shorter compared to "Public Procurement" ones.

Aggregation of EnPC projects preparation

The key EnPC technical assistance programme is performed through the **European Local Energy Assistance**. Till 2021 five ELENAs (EOL, PM4PM, EOMO, GOVDER, SE-ES) with projects implementing a budget of EUR 9.4 million and required leverage factor of realised

¹ Projects implemented under rules on the procedures established by the [Public Procurement Act \(ZJN-3\)](#).

projects at least 20, are successfully performed in Slovenia having a strong impact on the uptake of EnPC and other EE, RES and innovative urban transport investments, as well as allowing to reduce EnPC transaction costs:

- Energy renovation of Ljubljana (EOL), EUR 1.1 million, 2013 – 2016
- Energy renovation of cities Novo mesto, Celje, Kranj (EOMO), EUR 1.8 million, 2016 – 2019
- Preparation and Mobilisation of Financing for Sustainable Energy Investments in Primorska Region Municipalities (PM4PM), EUR 2.3 million, 2016 – 2020, 25 municipalities, 32 partners, 350 projects documents, pipeline of projects EUR 50.2 million
- Government Deep Energy Renovation (GOVDER), EUR 1.9 million, 2018 – 2021
- Sustainable Energy – East Slovenia (SE-ES), EUR 2.3 million, 2021 – 2024

EnPC ongoing and planned developments

A series of further EnPC measures are planned in the Long-Term Renovation Strategy 2021 and some already being developed. These measures comprise:

- Introducing specific and improved financing for leveraging private investment
 - On-bill financing/repayment financing option for deep renovation of multi-apartments buildings, including blending of financial sources and modified EnPC model (first call for Eco Fund grant and soft loan financing announced in August 2021)
 - Guarantee Fund
 - Forfeiting
- Upgrading EnPC quality assurance
 - Development of the EnPC accreditation scheme, including EnPC providers and EnPC facilitators training
 - Integration of quality criteria into standardised EnPC projects implementation and financing processes and related model documentation
- Developing internal and external capacities
 - The PP-EPS provides expert support for the identification of priority renovation projects, preparation of such projects, selection of the implementation and financing model, monitoring and verification of energy savings
 - The PP-EPS developing and promoting new implementation models to double renovation rate of public buildings (e.g. public-public partnership)
 - Development of one-stop-shop(s) for residential sector

3. CONCLUSIONS

The report includes an overview of 7 best practices from the five countries (Bulgaria, Croatia, Greece, Romania, and Slovenia). They range from specialized funds providing loans to public authorities, businesses, and individuals, as well as guarantees for ESCO companies (Bulgaria), EnPC in combination with grants (Greece, Croatia, and Slovenia), combinations of loans, grants, and technical assistance (Croatia and Greece), Green Mortgage (GM) product provided by commercial banks (Romania) to the provision of technical assistance for the identification and preparation of projects (Bulgaria, Croatia, Greece).

Based on the analysis, the following observations can be made:

- As can be expected, in all the countries mentioned above, there are financial instruments and programs to support energy efficiency and RES in buildings (private and public) and SMEs. Unfortunately, they are rather episodic and depend on the availability of public funds, which can hardly be described as sustainable and large-scale.
- Initiatives supported by the ELENA programme continue to be popular and sustainable, most often combined with other programmes (ELECTRA in Greece) and sustainable approaches (Design & Build and Design & Build & Finance in Croatia).
- Most of the examples shared in the document are focused or more successful in the public sector, but there are also initiatives targeting residential buildings and SMEs.
- Although ESG requirements for commercial banks are slowly coming on the agenda, there is still no serious activity on their part (except the Green Mortgage (GM) in Romania).
- There are various successful practices in the five countries based on different sustainable instruments and mechanisms, such as credit lines, dedicated funds, EnPCs, green mortgages and technical assistance, but others, such as tax/bill financing and green bonds, are still missing.

Finally, analysis shows that the development of sustainable financial instruments depends on strong political support and recognition of their importance by all stakeholders. This makes the SMAFIN Expanded project particularly relevant at this time, as it will provide an opportunity to identify the necessary policies and reforms needed to channel resources towards energy efficiency and renewable energy projects while ensuring that these projects meet high standards.