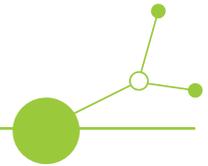


D.3.6.2 Implementation of Green Financing Methodology and innovative financing models with report on results



Version 1
07/2025





Content

1. Introduction	3
1.1. Overview of the MESTRI-CE Green Financing Methodology and Tools	4
1.2. Overview of the investment portfolio.....	5
1.3. Evaluation and implementation results	5
1.4. Implementation experience and recommendations for improvement and modifications	5
2. Austria.....	6
2.1. Overview of the investment portfolio.....	6
2.2. Evaluation and implementation results	6
2.3. Implementation experience and recommendations for improvement and modifications	6
3. Croatia	8
3.1. Overview of the investment portfolio.....	8
3.1.1. City of Zagreb.....	8
3.1.2. Krapina-Zagorje County	9
3.1.3. Zagreb County	9
3.1.4. Karlovac County	10
3.1.5. Privredna banka Zagreb d.d.	10
3.2. Evaluation and implementation results	11
3.2.1. City of Zagreb.....	11
3.2.2. Krapina-Zagorje County	12
3.2.3. Zagreb County	13
3.2.4. Privredna Banka Zagreb d.d.	14
3.3. Implementation experience and recommendations for improvement and modifications	15
4. Germany	16
4.1. Overview of the investment portfolio.....	16
4.2. Evaluation and implementation results	16
4.3. Implementation experience and recommendations for improvement and modifications	17
4.4. Summary of the other tested buildings	18
5. Italy	20
5.1. Overview of the investment portfolio.....	20
5.2. Evaluation and implementation results	20
5.3. Implementation experience and recommendations for improvement and modifications	22
6. Poland	23



6.1. Overview of the investment portfolio.....	23
6.2. Evaluation and implementation results	23
6.3. Implementation experience and recommendations for improvement and modifications	24



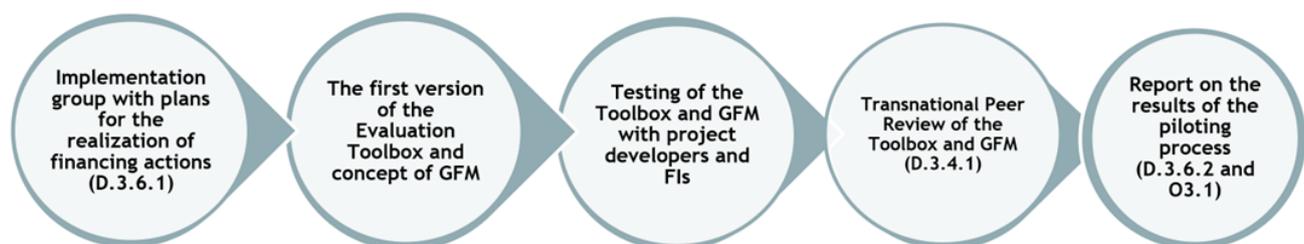
1. Introduction

The MESTRI-CE project aims to accelerate the energy transition in Central Europe by equipping public authorities with innovative tools and methodologies to plan, finance, and monitor energy efficiency measures. Financing the transition to climate-neutral buildings presents a significant challenge due to the high upfront costs of investments, lengthy financial payback periods, limited access to finance, and a lack of awareness and technical capacity among project developers. The MESTRI-CE project aims to address these issues by developing digital tools and methodologies for more effective evaluation of building renovation projects, as well as establishing Advisory hubs that provide technical and financial support to building owners throughout all phases of project implementation.

One of the project's key innovations is the development of the Green Financing Methodology and Tools for various financing models, which consists of two components:

- The Evaluation Toolbox for assessing financial feasibility and monetization of economic benefits of building renovation and construction projects (D.3.2.1).
- Green Financing Methodology with supporting documentation and performance tracking models (D.3.2.2)

The partnership has jointly developed the first versions of both the Evaluation Toolbox and the Green Financing Methodology, along with supporting documentation. The overall process is now entering the pilot phase (Picture 1), before the final version becomes available and the full market rollout commences.



Picture 1 The piloting phase of the Green Financing Methodology and Tools

Based on the baseline analysis of financing models, instruments, and policy frameworks in pilot countries (D.3.1.1) and market gap analysis (D.3.1.3), partners have selected different financing models to pilot with public and private project developers and financing institutions. Piloting and implementation of the developed Evaluation toolbox (D.3.2.1) and green financing methodology (D.3.2.2) have, in most cases, piloted and tested on buildings from the database of the MESTRI-CE Smart Data Hub (D.1.2.3), whose technical assessment has been made following the Sustainable Building Methodology (D.2.2.2) for (re)construction of buildings. The piloting phase required close cooperation between national Advisory Hubs and project developers (implementation groups), who tested the Evaluation Toolbox on their project portfolios and developed supporting documentation (e.g., investment studies/prospects) for financing institutions or investors. This process also required the involvement of financiers, to whom the Toolbox, its evaluation methodology, and the supporting documentation have been presented.

As each Advisory Hub is required to supervise the piloting process, the primary purpose of this report is:

1. To document the implementation process in each pilot region, including concrete investment opportunities and buildings on which the tool and methodologies were tested
2. To evaluate experiences of project developers, highlight successes, and identify challenges encountered during initial use



3. To provide concrete recommendations for improvement of the Evaluation Toolbox, the Green Financing Methodology, and the performance tracking models, ensuring a successful broader rollout in additional regions and markets.

The findings are based on implementation reports from pilot regions, feedback collected from end users, and joint reflection sessions held within the project consortium. The outcomes presented here will inform future developments of the Evaluation Toolbox, the Green Financing Methodology, and the performance tracking models and contribute to shaping a replicable and scalable approach for evaluating and financing investment projects. The structure of the report reflects these goals: it begins with an overview of the Green Financing Methodology and Tools' purpose and core features, followed by detailed insights from pilot implementations. It concludes with a set of lessons learned and recommendations for further development and wider deployment.

1.1. Overview of the MESTRI-CE Green Financing Methodology and Tools

The MESTRI-CE Financial and Economic Evaluation Toolbox with green building finance criteria is a digital Excel-based tool for assessment of financial feasibility and monetization of economic benefits of building renovation and construction projects. The Evaluation Toolbox is based on standard practices from the financial sector and the EU CBA methodology, which was needed for the economic assessment of investments. Since public sector building owners represent the primary focus of the MESTRI-CE project, the economic evaluation was integrated into the Toolbox to provide a different (socioeconomic) perspective on the cost-effectiveness of their investments. Economic analysis has also become increasingly important for financial institutions due to Environmental, Social, and Governance (ESG) requirements that their financial products and investments must comply with. Minimum compliance with the ESG is ensured through alignment with the criteria of the MESTRI-CE Sustainable Building Methodology (D.2.2.1).

Even though the Evaluation Toolbox employs a complex calculation methodology based on the EU's CBA guidelines and can produce a wide range of financial and economic key performance indicators (KPIs) as results, project developers are not required to provide all available information about their investments. The Evaluation Toolbox requires a minimum set of inputs, which include at least the capital expenditure (CAPEX) and operational expenditures (OPEX) before and after the building renovation, to calculate basic financial and economic KPIs. These inputs should ideally be drawn from the Smart Data Hub (D.1.2.3), the building's energy performance certificate, or be based on the project developers' estimates. In the piloting phase, the Toolbox is fully unlocked, configurable and country-specific assumptions and values regarding environmental impacts can be used instead of default ones, drawn from other EU projects. The Toolbox has seen two versions already, and some partners have tested them both on a concrete portfolio of buildings. The final version will be made once the piloting process is complete and all recommendations for its improvement are analyzed and discussed with the consortium.

The Green Financing Methodology is a structured approach to funding projects and investments that deliver environmental benefits. This methodology aligns financial activities with sustainability goals, including reducing carbon emissions, enhancing energy efficiency, and promoting the use of renewable energy. The Toolbox aims to provide all parties with a transparent methodology for evaluating financial and economic aspects, including environmental impacts and key financial performance indicators. For benchmarking and decision-making purposes, the Toolbox also includes a comparison of the overall costs of investing with different traditional and innovative funding/financing sources, which can be adjusted to country-specific conditions (default values are used in the basic settings).



Depending on the Evaluation Toolbox's results and market circumstances, project partners could have used the performance-tracking templates provided with the Green Financing Methodology deliverable or tailor them to suit the specific type of financing model they wish to implement within their region. Depending on the type of preferred financing/funding model, supporting documentation can be provided as an Annex to the report.

1.2. Overview of the investment portfolio

Pilot regions selected diverse building portfolios to test the functionality and adaptability of the Green Financing Methodology and Tools. The buildings included range from schools and kindergartens to administrative offices and cultural institutions, varying in size, age, and energy performance. The selected portfolios reflect the typical challenges of the public building stock in Central Europe, which require deep energy renovation, resulting in high capital expenditures for the owners. This diversity ensures a representative testing ground for the Evaluation Tool and provides valuable insights into its scalability. For each country, the building portfolio and some of the most important details about it (location, size, current condition) will be described to provide a better understanding of the tested buildings.

1.3. Evaluation and implementation results

Each building which was selected for testing with the Evaluation Toolbox, using the Green Financing Methodology, provided financial and economic evaluation KPIs that determined its investment cost-effectiveness, with individual results annexed as part of the report. Generally, the evaluation showed very different KPIs due to country-specific conditions (CAPEX/financial savings ratios) and the availability of more favourable financial and funding sources. The comparison of the overall costs of investing with different traditional and innovative funding/financing sources provided a preliminary estimate of the feasibility of applying funding/financing options for these investments. Implementation across the pilot regions revealed both strengths and challenges related to data availability, format inconsistencies, and limited technical resources, particularly during initial data uploads. This chapter describes the process in each country, drawing on the experiences and perspectives of the piloting project partners.

1.4. Implementation experience and recommendations for improvement and modifications

Users from public authorities, energy agencies, and financial institutions provided practical feedback on the usability and relevance of the Green Financing Methodology and Tools. Many appreciated the intuitive design, the potential for creating a comprehensive CBA analysis, and the simple yet straightforward dashboards. At the same time, users highlighted areas for improvement, such as more precise guidance for data input, a financial glossary, and the need for ongoing technical support. The country-specific experiences of the users are explained in this section.

Enhancements to the MESTRI-CE Green Financing Methodology and Tools should focus on regionalization (translation to national languages), the use of country-specific values in environmental impact analyses, and the incorporation of a financial guide within the Toolbox itself. Additional training materials and dedicated support channels can help build user confidence and reduce the entry barrier. To ensure ease of use for non-financial specialists, simplifying the input and main KPIs dashboards should be considered. Since the fields of improvement and modification highly rely on the partners' needs, each country specifies their fields of adaptation in the country-specific chapters.



2. Austria

2.1. Overview of the investment portfolio

The city of Bruck an der Mur has been selected for the development of an investment portfolio. The city owns around 34 public buildings, of which seven were identified as having the highest need for thermal renovation. These buildings—nicknamed "the 7 sins of Bruck an der Mur"—include the city hall, a gymnasium, a town hall, the building yard, the music school, the elementary school, and the kindergarten. Each of these buildings has undergone on-site assessments to evaluate their current condition and energy performance. The collected data has formed the basis for the MESTRI Smart Data Hub and has subsequently been used for the investment portfolio for the seven buildings. The investment portfolio seeks to enable structured renovation planning, scheduling measures, and exploration of financing options to support energy efficiency improvements in the city's public building stock.

Although the investment portfolio includes 7 buildings, the focus on the testing of the toolbox was on the gymnasium building, as this is one building from the portfolio where comprehensive data is available to be able to make concrete and implementable suggestions regarding the potential investment approaches.

The gymnasium building is a large building with a gross floor area of 1560m². The focus in the gymnasium building is on deep renovation of the insulation and the facade, the windows, heating, ventilation and air conditioning system and lighting. This deep renovation will be complemented by the introduction of a 180 KWp solar power plant, which will meet a large portion of the building's energy needs and from which excess production will be sold back to the grid. The heating system of the building will be changed from the current electric system to district heating combined with its solar power plant.

2.2. Evaluation and implementation results

The evaluation tool reflected a key challenge that the revenues from energy savings alone would not be expected to be sufficient to fund the project, as there is an estimated annual savings of approximately 66,400 EUR. Instead, some form of blended financing would likely be needed to make this project financially viable.

Another interesting result of the tool was that an additional revenue stream was predicted through selling energy back to the grid. This revenue stream was found as there was some expectation that given the capacity of the solar power plant, there was likely to be some excess generation thereby increasing the attractiveness of this approach.

2.3. Implementation experience and recommendations for improvement and modifications

One of the most plausible implementation approaches for this municipality is an ESCO approach. However, this toolbox is not adapted to test ESCO (EPC) models. This provided substantial challenges for testing this approach. Particularly, when seeking to demonstrate energy savings as a source of revenue and its corresponding impact on OPEX. Rethinking this to allow for an improved implementation experience when coming from an ESCO perspective would be a distinctive benefit.



Therefore, during our implementation process we tried to work around this obstacle. To do this two approaches were proposed, the first was to shift the energy costs in the OPEX sheet to zero, however this had two key limitations, the first is that it would interfere with the calculation of the FNPV(C), which calculates FNPV irrespective of how the investment is to be financed, and secondly there are still energy costs that would be incurred as OPEX costs, thus this approach would not be fully reflective. Instead, we inputted the energy and maintenance costs in the regular way and then selected “standard loan” as the financing option in the “General” sheet and put the terms/conditions of an EPC contract (duration, annuity) in the “Financing” sheet.

An additional recommendation would be to introduce a feature to combine several forms of financing. For example, in this case allowing for approaches which combine own capital and ESCOs. In general, in the Austrian context it would be very common for projects to be funded from various sources, as this allows for the advantages for different approaches to be leveraged to find the optimal tailored financing approach.



3. Croatia

3.1. Overview of the investment portfolio

The Implementation Plan, designed by the Advisory Hub, originally foresaw three regional public authorities and one commercial bank from North-West Croatia to be actively involved in the piloting actions as project developers. The plan has seen a slight deviation in the form of projects (buildings) for which the piloting actions were done and the project developers which were finally selected. The pilot actions included applying the Financial and Economic Evaluation Toolbox and the Green Financing Methodology, as well as determining the optimal funding/financing source based on the evaluation results and preparing the initial supporting documentation for specific financing sources. Overall, four project developers and one financial institution participated in the pilot action in Croatia, with the investment portfolio shown in each sub-chapter.

3.1.1. City of Zagreb

The City of Zagreb has more than 1.000 buildings in its portfolio, with over 70% requiring deep renovation. Such requirements for investment cannot be funded by any grant-based national renovation programme, which is the primary reason why Zagreb has decided to use debt-based financing as a primary financing source for its ambitious renovation targets set in the Climate City Contract 2030. The MESTRI-CE project significantly contributed to this decision, as bilateral consultations and roundtable sessions with financial institutions facilitated direct dialogue and the presentation of financial models available to cities with large building portfolios. The City initially planned to issue green bonds to finance the building renovations and make them available to citizens as an investment opportunity. Unfortunately, this plan was dropped in favour of the European Investment Bank's framework loan, which was equally willing to support the municipal green bond emission as an anchor investor. A significantly longer time was needed to prepare the emission; higher interest rates and substantial preparation costs were the main reasons why the municipal framework loan was ultimately chosen as the primary financing source. However, the municipal framework loan can also be considered as an innovative financial instrument, and the City signed the EUR 395 million loan contract in late 2023. Since the City did not have a mature, large portfolio of buildings ready to be financed and prepared under the EIB methodology, technical and financial analyses were required. The City has asked the members of the Advisory Hub to conduct a pilot evaluation of just one building at this point, with more to follow in the roll-out phase, once the portfolio of buildings becomes more extensive. Basic information about the selected building is shown below (Table 1)

Table 1 Information about the selected building and CAPEX of potential renovation measures

Building	Owner	Location	Renovation scenarios	Estimated CAPEX with VAT (EUR)
Health Center Siget	City of Zagreb	City of Zagreb	Deep renovation	5.902.180

The Health Center Siget is a very large building (5.997,62 m²) constructed in 1980. The building has inferior energy characteristics ($E (q_{hnd})$) but uses a centralized district heating system for heating purposes. The deep renovation scenario based on the based on the MESTRI-CE Sustainable Building Methodology foresees minimal energy savings of 55% and utilization of renewable energy sources from a new solar power plant.



3.1.2. Krapina-Zagorje County

Krapina-Zagorje County has an above-average number of buildings in its portfolio (around 180). The County has already ambitiously invested in energy renovation of over 50% of them, which, unfortunately, has also resulted in reaching the public debt limit (20% of total yearly budget revenues). Due to the fiscal limitation, the County is primarily interested in investing in energy renovation using innovative financing models that have a budget-neutral effect (ESCO-EPC, PPP) or public grant-support schemes with high co-funding rates (up to 85%). Citizen financing was unfortunately not an option for the County, although green bonds with citizens as investors were an intriguing alternative to traditional models.

As a result of a series of meetings with the Advisory hub team, Krapina-Zagorje County nominated two large buildings for the piloting evaluation, which require deep energy renovation. The estimated renovation costs of the two buildings range between EUR 3,1 and 3,8 million, depending on the scenario (Table 2).

Table 2 An overview of the portfolio of buildings and CAPEX of potential renovation scenarios

Building	Owner	Location	Renovation scenarios	Estimated CAPEX with VAT (EUR)
Special Hospital Stubičke toplice	Krapina-Zagorje County	Municipality of Donja Stubica	Integral renovation	553.197
			Deep renovation	702.597
			Comprehensive renovation	1.223.995
Secondary school Zlatar	Krapina-Zagorje County	City of Zlatar	Deep renovation	2.565.700

Special Hospital Stubičke Toplice is a large, four-story building (net area of 4.118,25 m²) built in 1980, currently in poor energy condition (energy class F). Although the building utilizes geothermal energy for heating, its entire heating system is outdated, and the building lacks exterior insulation, resulting in energy inefficiency. Due to the availability of renewable energy, the focus of the potential renovation scenarios was put on modernization of the heating system and the implementation of energy efficiency measures (external insulation, windows). Three different technical and financial scenarios were developed for this building: a deep, integral, and comprehensive renovation, based on the MESTRI-CE Sustainable Building Methodology for the reconstruction of buildings.

The Secondary School Zlatar is a mid-sized, four-storey building (net area of 2.295,20 m²) built in 1991, which requires a deep renovation due to the lack of investments in its energy efficiency over the past 35 years. The building is currently rated as an E (Eprim) energy class with no renewable energy systems of any kind. Just one renovation scenario was made for this building (deep renovation) due to the building's solid seismic characteristics (comprehensive renovation is not required).

3.1.3. Zagreb County

Zagreb County has an extensive portfolio of its buildings (around 200), for which a small number of detailed technical and financial analyses have been performed so far. The County nominated four mid-sized buildings for evaluation in terms of financial and economic profitability (Table 3). Three renovation scenarios had to be evaluated, in line with the models set by the national building renovation programme (i.e., the Energy Renovation of Public Sector Buildings). The total portfolio of potential renovation projects ranges between 1 and 1,95 million, depending on the renovation scenario.



The county's preferred type of financing is ESIF/RRF grant funding, due to its limited budgetary resources and favourable EU co-funding rates (ranging from 60% to 85%). However, for buildings which show very promising financial returns, the County has been willing to consider commercial and innovative models.

Table 3 An overview of the portfolio of buildings

Building	Owner	Location	Renovation scenarios	Estimated CAPEX with VAT (EUR)
Primary school Posavski Bregi	Zagreb County	City of Ivanić Grad	Integral renovation	117.810
			Deep renovation	156.005
			Comprehensive renovation	214.910
Primary school Ivan Perkovac	Zagreb County	Municipality of Brdovec	Integral renovation	254.918
			Deep renovation	291.718
			Comprehensive renovation	427.377
Primary school Vladimir Nazor	Zagreb County	Municipality of Pisarovina	Integral renovation	271.340
			Deep renovation	432.872
			Comprehensive renovation	541.408
Primary School Pokupsko	Zagreb County	Municipality of Pokupsko	Integral renovation	378.975
			Deep renovation	424.975
			Comprehensive renovation	768.078

3.1.4. Karlovac County

The project nominated by Karlovac County in the implementation plan: construction of the building for the new energy center in Šimunićeva street, has unfortunately been delayed, and insufficient information was provided to the Advisory hub to make a proper financial and economic assessment in the piloting process of MESTRI-CE. Therefore, the building will be assessed in the roll-out phase of the project, when more technical details become available. Initially, the County wanted to test the HBOR Urban Development Fund financing instrument which seemed like an optimal solution. One of the preconditions for using the UDF is to have a partially commercial use of the building that also generates enough revenues to repay the loan to the UDF. The County is still to make a final decision on the use of the building and if its designated use is fully non-commercial then the UDF will not be an option for the financing anymore.

3.1.5. Privredna banka Zagreb d.d.

Privredna banka Zagreb is one of the leading financial institutions in Croatia and a part of the Intesa Sanpaolo Group. Intesa Sanpaolo is committed to supporting the ESG transition, and one of the key aspects in reaching the ambitious carbon-neutral targets is achieving climate neutrality of the buildings owned by the Group. The PBZ has over one hundred buildings in Croatia in its portfolio, and a large part of them are energy inefficient. Following a bilateral meeting with the Advisory Hub, the Bank proposed that one of their key regional buildings be assessed using the MESTRI-CE Evaluation Toolbox and the Green Financing Methodology (Table 4). The interest of the PBZ in conducting such an analysis stem from the fact that the Intesa Sanpaolo group plans to issue a sustainability-linked bond, which will be used to finance these renovation projects and needs to comply with the ESG investment criteria.

Table 4 Information about the selected building and CAPEX

Building	Owner	Location	Renovation scenarios	Estimated CAPEX without VAT (EUR)
Regional office in Čakovec	Privredna banka Zagreb d.d.	City of Čakovec	Deep renovation - nZEB	579.000
			Deep renovation - ZEB	1.044.000

The building proposed by the PBZ is the regional branch office complex in the town of Čakovec, North Croatia. The complex was built in 1980 and comprises four buildings with a total net area of 3,968 m². The



complex was renovated in 2003 and 2023, during which new windows and a solar power plant were installed. The energy condition of the complex is unfortunately very poor (Eprim class F), since the building has no outer insulation of any kind. The focus of the renovation measures will be on outer wall insulation, heating and cooling systems and modernization of the indoor lighting. The investor specifically requested two building renovation scenarios: one that would result in nearly zero energy status (nZEB) and the other, a more ambitious scenario, that would classify the building as a zero-energy building (ZEB). Both scenarios are fully in line with the MESTRI-CE Green Building Methodology and standards. The primary criteria for selecting the optimal renovation scenario for further development and financing are financial KPIs, as the bank is not eligible to apply for any grant funding that could reward more ambitious energy savings. Economic analysis is also of some interest to the bank, considering that it plans to install sensing equipment in its building to monitor the indoor air quality and consequently the productiveness and health of its employees.

3.2. Evaluation and implementation results

3.2.1. City of Zagreb

The City of Zagreb nominated one pilot building for the evaluation, albeit a very large one. The **Health Center Siget** will undergo a deep energy renovation, which also includes integration of green infrastructure and some additional non-energy measures (fire safety corridors and accessibility/wheelchair ramps), making it a full ESG and MESTRI-CE Green Financing Methodology compliant investment. The implementation of deep renovation measures would result in achieving the energy class C (qhnd) and would lead to significant financial savings for the City. The results of the financial and economic assessment conducted with the Evaluation Toolbox have shown some interesting results (Table 5)

Table 5 Results of the financial and economic evaluation of the City of Zagreb's health center building

Building	Renovation scenarios	FNPV(C) (EUR)	FRR(C) (%)	SPP (y)	DPP (y)	FNPV(K) (EUR)	FRR(K) (%)	ENPV (EUR)	ERR (%)	B/C ratio
Health Center Siget	Deep renovation	-2.309.192	-0,70%	74	-	517.092	7,50%	4.597.147	11,70%	2,20

The financial KPIs are not favourable, as without any grant co-funding, the investment is not cost-effective due to the very large CAPEX and relatively inexpensive energy sources (public district heating system). The cost of energy from the district heating is heavily subsidized by the government, but the exact amount could not have been estimated for this analysis. The addition of a large solar power plant (260 kW) has significantly improved the financial viability of the investment; however, it is not yet sufficiently attractive to be commercially viable. Therefore, the City plans to undertake a financial construction project by nominating this building to the ESIF call for proposals in late 2025, aiming to secure at least 50% of the grant, with the remaining amount to be financed through the EIB framework loan. In such a case, the financial KPIs would improve significantly and would become positive (as seen by FNPV(K) and FRR(K)). The economic assessment yields predominantly positive results and benefits for society, although environmental impacts have not been fully accounted for (including the effects of integrating green infrastructure). Unfortunately, quantifying climate adaptation measures presents a challenge for project developers, although the Evaluation Toolbox offers the capability to calculate their impacts in the economic assessment section. The developed MESTRI-CE performance tracking documentation will also be utilized if the City implements the investment.



3.2.2. Krapina-Zagorje County

The Financial and Economic Evaluation Toolbox with Green Financing Criteria was used for the assessment of two buildings nominated by Krapina-Zagorje County, yielding significantly different results (Table 6).

Table 6 Results of the financial and economic evaluation of Krapina-Zagorje County's portfolio of buildings

Building	Renovation scenarios	FNPV(C) (EUR)	FRR(C) (%)	SPP (y)	DPP (y)	FNPV(K) (EUR)	FRR(K) (%)	ENPV (EUR)	ERR (%)	B/C ratio
Special Hospital Stubičke Toplice	Integral renovation	-350.456	-1,92%	443	-	-137.687	0,83%	-85.673	1,62%	0,84
	Deep renovation	-133.444	2,17%	24	-	1.670	4,03%	494.563	8,93%	1,75
	Comprehensive renovation	-316.562	0,90%	33	-	-128.255	2,54%	440.864	6,85%	1,47
Secondary school Zlatar	Deep renovation	-1.791.193	-5,19%	43	-	-310.982	0,98%	489.608	5,36%	1,31

The financial analysis of the three renovation scenarios for the **Special Hospital Stubičke Toplice** yielded unfavourable results, primarily due to the building's use of free (geothermal) energy for heating purposes. The integral renovation, which only intervenes in the building's envelope (insulation, windows), is particularly cost inefficient. Deep renovation, which also involves the cooling systems and the production of renewable energy (from a solar power plant), significantly improves the financial KPIs. Comprehensive renovation, expectedly, has no business case as additional interventions in seismic resilience and fire prevention measures do not improve financial profitability. Economic analysis, however, reveals the actual value of the latter two renovation scenarios for society, with all major KPIs being positive due to their high environmental benefits.

A comparison of different funding and financing models was made in the Evaluation Toolbox to determine the overall costs of financing the deep renovation of the building. Due to its low financial and high economic profitability, Krapina-Zagorje would prefer to nominate the building for the Energy Renovation of Public Sector Buildings call for proposals (ESIF OP 2021-2027), for which two potential investments can obtain up to 85% co-funding. Krapina-Zagorje County was also interested in the new ESI financial instrument, the Urban Development Fund (UDF), administered by the Croatian Bank for Reconstruction and Development (HBOR). The UDF provides up to 50% grant co-funding for CAPEX investments in more commercially oriented, publicly owned buildings, such as this one. Since the new ESIF calls for proposals are expected in 2025, the County would like to apply and try to obtain more favourable funding before testing the HBOR UDF financial instrument. In any case, as supporting documentation for this process, the Croatian Advisory Hub has developed a feasibility study and performance tracking documentation to assist the County in determining the final specifications for the development of the main renovation project design.

Only one renovation scenario was evaluated for the **Secondary School Zlatar** since the building does not require a comprehensive renovation. The initial financial evaluation of the deep renovation scenario showed mixed results, depending on the evaluation period length (10-20 years). The investment proved to be financially ineffective without grant support, although the unavailability of precise maintenance OPEX due to the lack of historical data influenced the actual profitability of the scenario. The economic analysis showed that the investment was beneficial for society, with all KPIs being positive. With RRF funds from the Energy Renovation of Public Sector Buildings programme exhausted, the Advisory Hub proposed nominating the building for renovation through APN's (Agency for Transactions and Mediation in Immovable Properties) Energy Performance Contract (ESCO) model. The innovative EPC model, considered budget-neutral for



public authorities in Croatia, utilises a grant of up to 40% to enhance the cost-effectiveness of the investment for the investor and increase its attractiveness to the ESCO. Several consultations with different energy service companies proved that there was a legitimate interest from their side, and the Krapina-Zagorje County decided to apply for the APN EPC programme, with the assistance of the Advisory Hub (mostly REGEA). Depending on the results of the public procurement, a contract could be signed with an ESCO. The MESTRI-CE performance tracking documentation will be utilized if the investment is finalized.

3.2.3. Zagreb County

Four buildings of the same type (primary schools) were selected by Zagreb County for assessment using MESTRI-CE financial tools. Three renovation scenarios were considered for all buildings, and the results of financial assessments are primarily negative, showing low profitability and high economic benefits for society (Table 7).

Table 7 Results of the financial and economic evaluation of Zagreb County's portfolio of buildings

Building	Renovation scenarios	FNPV(C) (EUR)	FRR(C) (%)	SPP (y)	DPP (y)	FNPV(K) (EUR)	FRR(K) (%)	ENPV (EUR)	ERR (%)	B/C ratio
Primary school Posavski Bregi	Integral renovation	-31.287	1,42%	25	-	14.025	5,60%	104.008	11,40%	3,66
	Deep renovation	-6.969	3,63%	18	-	21.669	5,28%	210.328	13,90%	5,93
	Comprehensive renovation	-49.495	1,99%	21	-	-12.360	3,44%	201.180	11,17%	3,28
Primary school Ivan Perkovac	Integral renovation	-165.347	-1,59%	204	-	-68.236	-1,30%	-62.642	-2,43%	0,73
	Deep renovation	-199.688	-2,27%	233	-	-158.014	-1,40%	-64.522	2,63%	0,76
	Comprehensive renovation	-299.021	-2,40%	343	-	-237.825	-1,50%	-104.220	2,39%	0,74
Primary school Vladimir Nazor	Integral renovation	103.593	7,54%	9,15	15,6	207.955	14,40%	580.593	22,10%	3,88
	Deep renovation	497.443	12,88%	7,05	8,6	575.485	15,66%	1.648.400	30,54%	2,29
	Comprehensive renovation	399.498	9,77%	8,98	11,35	497.108	12,13%	1.627.328	25,10%	3,12
Primary School Pokupsko	Integral renovation	-252.813	-1,79%	303	-	-108.441	-1,00%	-101.821	-2,18%	0,71
	Deep renovation	-296.623	-2,40%	340	-	-235.912	-1,50%	-103.146	-2,39%	0,74
	Comprehensive renovation	-420.220	-2,33%	492	-	-342.440	-1,70%	-162.988	2,16%	0,71

The financial analysis of the three renovation scenarios for the **Primary School Posavski Bregi** showed passable financial indicators for the deep renovation scenario, primarily due to a favourable investment (CAPEX) to financial savings ratio. The introduction of a solar power plant also increased the financial KPIs, making the investment borderline commercially viable. However, a comparison of different financial models showed that grant co-funding would be needed to make the investment more attractive for private financing models (green loans and the EPC). The County was interested in HBOR's Urban Development Fund but could not meet the mandatory commercial criteria needed to be eligible for this financial instrument. The additional issue with the building is that it requires a comprehensive renovation to enhance its seismic characteristics. Such an increase in CAPEX, while retaining the same financial savings, significantly deteriorates the already average financial KPIs. The economic analysis, on the other hand, reveals high societal benefits in both renovation scenarios. As a relatively small building, the County plans to primarily



apply the investment to the ESIF call or bundle the investment into a larger portfolio and attempt to secure a green loan (HBOR or EIB). The Croatian Advisory Hub has developed a feasibility study and performance tracking documentation to assist the County in this process.

The **Primary School Ivan Perkovac** is a smaller building (1.289 m²), which was built in 1963 and has undergone several partial renovations since then. Due to these previous modernisations, neither renovation scenario resulted in significant financial savings. Financial KPIs were below average (all negative), and even the economic assessment did not show positive results (due to low CO₂ reductions). The general conclusion was to bundle this investment into a portfolio of buildings, as neither the funding nor the financing model is feasible for the investor if significant financial or economic returns are expected. The Croatian Advisory Hub has, nevertheless, developed a feasibility study and performance tracking documentation to assist the County in its decision-making process.

The **Primary School Vladimir Nazor** is a medium-sized building (1.925 m²) from 1963, which was enlarged in 1979. In 2007, a new sports gym was added to the complex. The main building has very poor energy characteristics (E (q_{hnd})/G (Eprim) class) and is currently still using fuel oil for heating purposes. As expected, such poor condition of the building resulted in very positive financial indicators with all three renovation scenarios. The deep renovation scenario even has the potential to be financed with commercial instruments and models (EPC, green loan). Still, the building must undergo seismic reinforcements due to its old age, which undermines its financial profitability to some extent. The economic analysis shows very positive results due to the replacement of an environmentally harmful carrier with clean renewable energy. Zagreb County will first try to apply the investment in the comprehensive renovation of the building for the ESIF grant (up to 85%) before exploring other commercial instruments (e.g. HBOR loans). The Croatian Advisory Hub has developed a feasibility study and performance tracking documentation to assist the County in this process.

The **Primary School Pokupsko** is a medium-sized (1.849 m²) building from 1976. It is in average condition, energy-wise (E (q_{hnd})/C (Eprim) class), with a peculiar fact that is fully connected to a local biomass-based district heating system. With heating fully powered by renewable energy, the renovation scenarios focused on enhancing the building's energy efficiency and installing a solar power plant. However, all three renovation scenarios cannot be justified from a financial side, as all major KPIs are negative (due to low energy/financial savings). With renewable heating already in place, the economic analysis also showed negative results in all three scenarios. The recommendation for this building is to either bundle it as part of a larger portfolio or to focus on single energy measures (e.g., a solar power plant), which is a commercial investment. The Advisory Hub also recommended that the solar power plant could be realized through a citizen-led investment model (energy community/cooperative), which could be implemented with the assistance of the Advisory Hub (primarily the Green Energy Cooperative) if the County wishes to test this model during the roll-out stage of the MESTRI-CE project.

3.2.4. Privredna Banka Zagreb d.d.

One large bank complex was chosen to be assessed with the MESTRI-CE financial and economic tools. Two renovation scenarios were considered for the complex (nZEB and ZEB), and the results of financial assessments are primarily negative, showing low profitability and high economic benefits for society (Table 8). The results are somewhat expected as very deep renovation measures were proposed. Since the project developer set cost-effectiveness as the primary decision-making criterion, the nearly zero energy renovation scenario has been chosen as the optimal one. The bank will continue with the development of the project main design for the renovation in accordance with the nZEB standard and preparation for the financing.



Table 8 Results of the financial and economic evaluation of PBZ's building

Building	Renovation scenarios	FNPV(C) (EUR)	FRR(C) (%)	SPP (y)	DPP (y)	FNPV(K) (EUR)	FRR(K) (%)	ENPV (EUR)	ERR (%)	B/C ratio
Regional office in Čakovec	nZEB standard	-174.352	0,5%	18,8	-	-174.352	0,5%	584.235	13,2%	3,1
	ZEB standard	-598.240	-3,5%	55,2	-	-598.240	-3,5%	720.325	10,6%	2,0

3.3. Implementation experience and recommendations for improvement and modifications

Overall, the Financial and Economic Toolbox and the Green Financing Methodology were generally well-received among the project developers participating in the piloting process. The addition of the sheet that compares the costs of different funding and financing sources was an attractive visual and informative feature that supported the developers in making decisions about the optimal ways to finance their investments.

The Toolbox has been developed over an extended period and thus has had several versions, which were not received equally well. The first version was criticized due to the complicated interface and too many visible Excel sheets, which were confusing for some users. The second version fully addressed this issue, but the general comment was that the Toolbox was still primarily targeting financial experts who also needed to understand the technical aspects of the investments. Although this issue is addressed in the form of a separate deliverable (D.3.2.2 Green Financing Methodology), which explains the green socioeconomic methodology, the final version of the Toolbox will include an integrated manual on how to use the Toolbox and interpret the results of the financial and economic analyses (key KPIs). Some developers also complained about the evaluation period, which was set at a maximum of 20 years, considering that the economic life of some equipment can be up to 40 years, and this can result in very high residual values of the equipment at the end of the evaluation period. As explained in the European Commission's CBA/Vademecum documents and the MESTRI-CE Green Financing Methodology, it is recommended to set the evaluation period at 20 years, but it can be extended to 30-40 years, as was ultimately done in the second edition of the Toolbox.

During the piloting process, several additional issues have been noticed:

- Availability of the energy data was not an issue, as all buildings had accurate data on real energy consumption collected from several previous years. However, the information about the building's maintenance costs was usually missing and had to be either estimated or ignored altogether, which impacted the overall results of the financial and economic analyses
- Availability of quantified environmental effects of energy measures - there was not a single building in the piloting process that had available data on additional environmental impacts of the proposed renovation measures aside from the reduction of CO₂ emissions. This can be attributed to the lack of experience with assessments of such impacts and no proven mainstream methodology for the estimation of the environmental effects of implemented energy measures



4. Germany

4.1. Overview of the investment portfolio

WBG Nürnberg GmbH is Nuremberg's municipal housing company, overseeing more than 18,500 company-owned rental units—representing about 10% of the city's housing stock—along with around 6,400 additional residential and commercial spaces. Established in 1918, the company is actively engaged in both new construction and modernization efforts.

A key feature of its property portfolio is the serial energy-efficient renovation of older buildings. Numerous residential complexes have been retrofitted with insulation and connected to district heating, resulting in an estimated 70% reduction in CO₂ emissions since 1990.

The portfolio includes a mix of subsidized and market-rate housing, municipal buildings, and commercial properties, with a strong focus on sustainability, affordable living, and social infrastructure.

For testing the smart data hub, WBG selected older residential buildings from various construction decades that are in need of renovation. Thereby, one of the buildings already has a detailed plan for the upcoming renovation measures and was chosen for the most detailed testing of the MESTRI-CE financial and economic toolbox. This building is described in most depth as it provides the most detailed and valuable information and has often been discussed between EAN and the pilot partner. As the 6 other buildings have a less detailed data input and their renovation plans are not as far progressed. Moreover, some of the buildings are very similar to each other. Their renovation plans exported from the smart data hub as well as the toolbox dashboards are printed in the Appendix. The experiences from the testing of all 7 buildings has been reflected in the review in this report.

The test building consists of 40 rented residential units with a total residential surface of 4000m². The building was built in 1930 with minor renovations done in 1986 and 2003. After a detailed analysis, the building will be renovated with new insulation, windows and a switch from fossil gas to district heating in 2027.

In line with the climate strategy of WBG, the focus goal of the renovation is maximum CO₂ reduction. The district heating network in Nuremberg has an estimated CO₂ emission factor of 0,156g/kWh. Moreover, the estimated reduction of heating energy achieved through insulation and windows is 40%.

4.2. Evaluation and implementation results

The toolbox dashboard is printed out in the Appendix.

The information input for the test building was generally positive. As the building is already very well analyzed, the correct CAPEX, old OPEX and estimated future OPEX were all known as well as CO₂ reduction goals.

The results fit the expected analysis well except for the big missing opportunity to combine several financing methods (see next section). As the plan is to pay 50% from own funds and 50% on a loan, this model was narrowed by using the loan+grant version with 50% and the own funds + grant version with 50%. The loan conditions are known because they rely on a framework loan. As always with analysis tools, the detailed input enables detailed results.



4.3. Implementation experience and recommendations for improvement and modifications

The first very important missing feature is the possibility to combine several forms of financing. In Germany, it is very rare to finance projects with just one source and far more probable to combine own funds with a loan or several loans with different duration and interest rates (for example with a standard loan and a home loan and savings contract). A good possibility would be to put different percentages on the different financing models. In a further step, it would be even better if follow-up financing could also be included.

During the testing, the analysis proved to be a very valuable tool for a specific user group: it is far too complicated and confusing for most private stakeholders, but finance experts would always use their own even more precise calculations. This leads to smaller housing-cooperatives, building managers, small communalities and other players with professional dimensions but who may not have in-house financial or controlling experts. For example, our pilot partner would not use it in reality because they are a big housing company with several in-house financial experts.

In the application, this means that the tool would be used by users who have some financial and economic knowledge, but do not know all the details of the analysis parameters. Moreover, they may have to explain the outcomes to their colleagues who have no expertise in the field. This user profile leads to some suggestions regarding the simplicity of the evaluation toolbox.

First, some of the parameters should be provide with a short definition and a range of reasonable values in a little information box. This could be for example the difference between financial and social discount rate, both with a hint about their usual height. Another example would be the EuGBS-SLB bond. As noted after the testing, some of those explanations were given in the first toolbox version and will be transferred to the current version.

We also suggest a switch between the dashboard and the Technical section: The sensitivity analysis is an important analysis tool, but doesn't speak well to non-professional users. Instead, the timelines provided in the Technical section is of big interest to most people as it provides a visual overview over the yearly cashflow. We therefore suggest to switch those two visualizations. In order to still include the sensitivity analysis in the dashboard, it could be provided with a short statement leading to the Technical section for further information.

We also thought of a more visual way to present the section 5 (results of the financial and economic analysis) for the user. This could be done with a traffic-light summary of the investment. Thereby, a green light would mean that the investment is very profitable with the given interest rates and revenues. A yellow light would mean that the investment is barely feasible and should be analysed very thoroughly in order to prevent a bad investment. And a red traffic light would mean that under the given conditions, the planned investment is economically a bad decision.



4.4. Summary of the other tested buildings

All 6 other buildings tested from the WBG portfolio are multi-unit residential buildings while three of them also have office or sale units in the ground floor.

Here is an overview over the key facts:

Rothenburger Straße 12-14:

Construction year: 1922

Heated ground surface: 2061 m²

Current heating system: gas heating

Recommended measures: air-source heat pump, insulation/renovation of the roof, façade and cellar ceiling, new windows, PV

Klaus-Groth-Straße 1-3:

Construction year: 1957

Heated ground surface: 690 m²

Current heating system: gas heating

Recommended measures: groundwater-source heat pump, insulation/renovation of the roof and façade, new windows, PV

Bucher Straße 58-60:

Construction year: 1910

Heated ground surface: 1520 m²

Current heating system: gas heating

Recommended measures: pellet heating, insulation/renovation of the roof, cellar ceiling and façade, new windows, PV

Harrichstraße 30:

Construction year: 1959

Heated ground surface: 243 m²

Current heating system: gas heating

Recommended measures groundwater-source heat pump, insulation/renovation of the roof and façade, new windows, PV

Wurzelbauerstraße 29:



Construction year: 1895

Heated ground surface: 564 m²

Current heating system: gas heating

Recommended measures groundwater-source heat pump, insulation/renovation of the roof and façade, new windows, PV

Ostendstraße 223:

Construction year: 1974

Heated ground surface: 2192 m²

Current heating system: oil heating

Recommended measures: pellet heating, insulation/renovation of the roof and façade, new windows, PV

.



5. Italy

5.1. Overview of the investment portfolio

The building portfolio selected for testing the MESTRI-CE tools comprises seven properties owned by the Autonomous Province of Bolzano. These include schools and provincial offices, for which several renovation interventions are required to improve energy efficiency and reduce overall CO₂ emissions by 2050.

The MESTRI-CE Financial and Economic Evaluation Toolbox was used to analyse the investment required for the energy renovation of two buildings in the selected portfolio.

The 'J. Ferrari' school is a six-storey building with a total heated area of 7,085 m², built around 1960 and partially renovated at the beginning of this century. Two gas boilers are currently used to heat the building. A deep renovation is planned, involving the insulation of the building envelope, replacement of the windows, and electrification of the heating system. These interventions are expected to reduce the building's total primary energy demand by over 50% and its CO₂ emissions by around 60%.

For the 'Savoy' professional school, a historic building dating back to the late 19th century, the renovation plan includes measures to reduce the building's overall energy demand and increase on-site electricity production. These measures consist of insulating the roof and installing a PV system in 2026, followed by replacing the windows and insulating the façade in 2030. The building is currently connected to the local district heating system using gas cogeneration, which has an actual CO₂ emission factor of 0.406 g/kWh. The estimated total primary energy reduction after the renovation is around 40%.

5.2. Evaluation and implementation results

Technical renovation scenarios were developed for the selected buildings using the Sustainable Building Methodology and the Smart Data Hub. These were then evaluated using the MESTRI-CE Financial and Economic Evaluation Toolbox to test the tools' functionalities and gain an initial understanding of the feasibility of different funding and financing options.

To test the tool, three renovation scenarios with increasing CAPEX were evaluated for the 'J. Ferrari' school, as shown in the table below.

Table 9 Information about the selected building and CAPEX

Building	Owner	Location	Renovation scenarios	Estimated CAPEX without VAT (EUR)
School "J. Ferrari"	PAB	Merano	1-PV+roof insulation	1.007.200
			2-PV+envelope insulation + windows	3.552.800
			3-Deep renovation	6.897.400

The results of the evaluation of the three scenarios show that the financial KPIs are particularly negative for scenarios 2 and 3. This means that interventions on the building envelope and the heating and cooling generation system are not cost-efficient without grant support. Conversely, all economic KPIs are positive for all scenarios, with a B/C ratio ranging from 1.2 to 2.2, demonstrating the environmental benefits of the interventions resulting from reduced CO₂ emissions of the building.



Table 10 Results of the financial and economic evaluation of renovation scenarios

Building	Renovation scenarios	FNPV(C) (EUR)	FRR(C) (%)	FNPV(K) (EUR)	FRR(K) (%)	SPP (yr)	ENPV (EUR)	ERR (%)	B/C ratio
School "J.Ferrari"	1-PV+roof insulation	-254.434	1,4%	152.340	9,2%	23,2	1.124.482	12,8	2,2
	2-PV+envelope insulation+ windows	-1.983.04	-3,4%	-1.112.51	-6,5%	-	1.573.745	7,8%	1,5
	3-Deep renovation	-4.714.370	-7,9%	-4.497.58	-13,8%	-	1.441.738	5,7%	1,2

For the 'Savoy' professional school, two renovation scenarios were evaluated: one with low CAPEX consisting of roof insulation and PV system installation, and one with higher CAPEX aiming to achieve greater energy savings through window replacement and external wall insulation. The possible future decarbonisation of the district heating system was not considered in the evaluation.

Table 11 Information about the selected building and CAPEX

Building	Owner	Location	Renovation scenarios	Estimated CAPEX without VAT (EUR)
Savoy professional school	PAB	Merano	1-PV+ roof insulation	348.600
			2-Deep renovation	1.008.600

Although the most significant input data was available for both scenarios, a more detailed cost analysis based on a detailed renovation project would be needed to refine the final results. A comparison of different funding and financial models suggested that the option of owner funding plus 50% grant support was the most profitable and viable for the owner, given the current co-funding options available at the national level.

Table 12 Results of the financial and economic evaluation of renovation scenarios

Building	Renovation scenarios	FNPV(C) (EUR)	FRR(C) (%)	FNPV(K) (EUR)	FRR(K) (%)	SPP (yr)	ENPV (EUR)	ERR (%)	B/C ratio
Savoy professional school	1-PV +roof insulation	-112.573	0,2%	55.023	7,0%	18,9	384.412	14,2%	2,2
	2-Deep renovation	-459.742	-2,3%	-20.910	3,5%	-	538.530	9,5%	1,6



5.3. Implementation experience and recommendations for improvement and modifications

The initial testing of the MESTRI-CE Financial and Economic Evaluation Toolbox, particularly the latest version, demonstrated its valuable potential in supporting project developers in making decisions about future investment in energy renovation.

The project developers involved by the Advisory Hub particularly appreciated the user-friendly data input and the dashboard visualising the results with the most significant financial and economic KPIs. However, during the pilot phase, it was demonstrated that project developers with less experience in financial and economic analysis found it challenging to accurately input certain data, as they lacked specific knowledge of the underlying evaluation methodology. Non-experts also found it difficult to critically read the final evaluation KPIs and sensitivity graphs. For this reason, a user guide on how to use the tool and correctly interpret the results would facilitate a wider dissemination of the instrument in the roll-out phase. A desirable feature for the final version of the tool would also be a printable and easy-to-read report containing the most important calculated financial and economic data and KPIs.

Regarding the data required for the analyses, the most critical issues reported were the estimation of future maintenance costs for buildings and equipment, as well as the avoidance of airborne pollutants. More support from the Advisory Hub is also needed to inform assumptions about the financial and preparatory costs of some financing models that are not well understood or frequently used by non-financial experts (e.g., bonds).



6. Poland

6.1. Overview of the investment portfolio

The portfolio chosen for testing the MESTRI-CE tools consists of twenty buildings in Masovian Voivodeship. Almost all of them are from public sector - schools, hospitals, public administration buildings and are characterized by poorly insulation, low energy efficiency, lack of renewable energy sources and are equipped with old, inefficient installations. They are energy-intensive. To assess the financial and economic implications of these upgrades, the MESTRI-CE Financial and Economic Evaluation Toolbox was applied to one building from the portfolio - primary school in Wysoka, in the municipality of Szydłowiec. Building is from 1994, has three floors and total heated area of 4.152,1 m². Approximately 135 people use this building during the school year. Currently, the building is heated by an oil boiler (central heating) and hot water is produced by an electric water heater. The planned comprehensive renovation includes thermal insulation of external walls and flat roof, replacement of windows and external doors, installation of renewable energy sources in the form of a heat pump, operating in a system with the existing oil boiler. These upgrades are projected to lower the building's primary energy use by more than 90% and increase the share of renewable energy sources from 0% to almost 50%.

6.2. Evaluation and implementation results

The toolbox dashboard is printed out in the Appendix.

The input data for the Polish pilot building - a primary school in Wysoka - was complete and reliable. As the project was already well-prepared, accurate values for CAPEX, current and future OPEX, and CO₂ reduction targets were available.

The results confirmed the expectations: although the project is not financially viable on its own (showing negative FNPV and FRR), the socio-economic performance is clearly positive. The economic net present value (ENPV) is positive, and the benefit-cost ratio (B/C) exceeds 1.5, which confirms the project's public value.

Among the most significant quantified benefits are:

- Avoided CO₂ emissions,
- Extension of the building's useful life,
- Increase in property value.

These effects justify public support or blended financing, especially for non-commercial buildings like schools. The case confirms that investments in energy retrofits may not generate short-term financial returns but deliver long-term environmental and societal gains.

As always with analysis tools, high-quality input leads to reliable results - particularly in the assessment of long-term public value.



6.3. Implementation experience and recommendations for improvement and modifications

The financial and economic evaluation toolbox used in the Polish pilot proved to be a highly advanced and professional analytical instrument, well-suited for evaluating investment projects in the public building sector. It enables a comprehensive assessment of both financial feasibility and broader socio-economic impacts, such as CO₂ emission reductions, increased property value, and extended building life cycle.

The tool's structured layout and configurable dashboard allow experienced users to compare financing options, model future OPEX, and conduct detailed sensitivity analyses. This makes it particularly valuable when exploring different public-private funding blends or assessing the societal return on investment.

However, despite its analytical strength, the tool presents a steep learning curve for users without a background in public finance or cost-benefit analysis. In the absence of a detailed manual, less experienced project developers may find it difficult to:

- choose the appropriate financing scheme,
- understand key indicators like FNPV, ERR, or B/C Ratio,
- or interpret outputs in a meaningful way for decision-making bodies.

To improve accessibility and support broader uptake, the pilot has shown that the tool would benefit from:

- a step-by-step user guide explaining both technical and conceptual elements,
- illustrative examples tailored to public sector use cases (e.g. schools, municipal buildings),
- and a printable summary report that presents key results in a clear and communicative format.

Overall, the tool demonstrates strong potential to professionalize investment preparation in energy renovation, provided adequate training and guidance materials are made available to non-expert users.