



European Construction Sector Observatory

Policy fact sheet

Poland

Thermal Modernisation & Renovation Fund

Thematic objectives 1 & 3

December 2019

In a nutshell

Implementing body	Bank Gospodarstwa Krajowego (BGK)
Key features & objectives	Financial support programme providing grants and soft loans to support the thermal modernisation and renovation of the Polish residential building stock.
Implementation date	1999-present: <ul style="list-style-type: none"> • 1999-2008 (Thermal Modernisation Fund, TMF) • 21 November 2008 to present¹ (Thermal Modernisation & Renovation Fund, TMRF)
Targeted beneficiaries	Owners of housing resources (municipalities, housing cooperatives, owners of company flats and private owners), as well as residents. 38,000 applicants (owners) have received funding to date.
Targeted sub-sectors	Residential
Budget (EUR)	1999 – 2018: 600 million (PLN 2.575 billion) Since 2008: 296.5 million (PLN 1.273 billion) ²
Good practice	★ ★ ★ ☆ ☆
Transferability	★ ★ ★ ☆ ☆

Two-thirds (67%) of Poland's total building stock are residential buildings, approximately half of which were built before 1980. The majority of single and multi-family buildings are either uninsulated or poorly insulated³.

The Thermal Modernisation Act 1998 was one of the early pieces of legislation to be introduced in Poland to support energy efficiency improvements in buildings. The Act provided a legal framework for the provision of financial support to building

owners, enabling them to reduce their energy consumption⁴. In 2009, the Act was superseded by the Thermal Modernisation and Renovation Act.

These two Acts laid the foundations for the launch of two sequential financial support schemes by the government – the Thermal Modernisation Fund (TMF) and the Thermal Modernisation and Renovation Fund (TMRF).

The purpose of these schemes was to help improve the technical condition of the Polish residential building stock, with particular emphasis on their thermal modernisation. The TMRF is still in operation and is scheduled to continue until at least 2029. The scheme is open to owners of housing resources (municipalities, housing cooperatives, owners of company apartments and private owners).

The TMRF supports both thermal modernisation projects and renovation projects. It also provides compensation grants to support owners of residential buildings subject to regulated rent in the past.

TMRF support is provided in the form of grants. In fact, grants are awarded as a repayment of part of the loan used for the project. The repayment is made from the Thermal Modernisation and Renovation Fund, supported by Poland's national development bank, Bank Gospodarstwa Krajowego, with the use of funds from the state budget⁵.

By 2018, the current and previous schemes had awarded close to a total of 43,000 grants, the majority of which were used to fund thermal modernisation projects. The overall application success rate has been over 90%. However, in spite of these results, the general consensus is that public demand for the TMRF scheme and its predecessor has been relatively low, compared to the number of Polish residential buildings that are in need of improvements. Increased levels of investment and better use of financial instruments are recommended to help improve the long-term impact of the scheme.

1.

General description

The Thermal Modernisation and Renovation Fund (TMRF) provides three forms of financial assistance to support the implementation of thermal modernisation and renovation projects:

- Thermal modernisation grants;
- Renovation grants;
- Compensation grants.

The scheme is operated by Poland's national development bank, Bank Gospodarstwa Krajowego (BGK). To receive a grant under the scheme, applicants must submit a grant application to an authorised financial lender – e.g. one of the thirteen banks that BGK has contracted to participate in the TMRF scheme. The lender then passes the application to BGK together with supporting documentation and a loan agreement between the lender and the applicant, provided that the bonus is granted. BGK carries out the verification of the received documents and decides i) whether to award a grant and ii) the amount of that grant. Grants are paid out by BGK to applicants through their lender once the project has been completed. Typically, a grant is received in the form of a discount (e.g. 20%) on the repayable value of the loan an applicant has taken out with their lender.

Thermal modernisation grants⁶ ...

... support improvement projects that aim to reduce energy consumption in buildings and energy bills for owners and residents. They are available to municipalities, housing cooperatives, housing communities and owners of single-family houses.

The types of modernisation work that are eligible for grant funding include:

- External wall insulation;
- Window replacement or renovation;
- Heating system improvement/replacement;
- Ventilation system improvement/replacement;
- Hot water production system improvement.

To meet the grant funding conditions, a thermal modernisation project must achieve a minimum set of energy savings objectives, depending on the nature of the improvement work:

- Reduced annual energy consumption in buildings for heating and hot water by at least:
 - 10% for heating system is modernisation;
 - 15% for heating system is modernisation in buildings constructed after 1984;
 - 25% in other buildings (heating and hot water);
- Reduced annual energy losses in local heating networks and local heating sources supplying them by at least 25%;
- Reduced energy costs for buildings by at least 20% by replacing local sources of heating with connections to central sources of heating (either within a single building or on a wider basis as part of a district heating network).

Thermal modernisation grants are awarded as:

- A fixed percentage (20%) of the total value of the loan taken out by the applicant from a financial lender (e.g. bank) to finance the implementation of their thermal modernisation project – effectively reducing the amount of the loan that has to be repaid;

so long as that amount is not more than:

- 16% of the total implementation cost of the thermal modernisation project;
- Double the expected annual energy cost savings, determined on the basis of an energy audit.

Renovation grants⁷ ...

... support extensive renovation projects that aim to significantly improve the condition of some of the oldest multi-apartment buildings in the country, which were built prior to 14 August 1961.

These buildings are typically in bad conditions and contain the lowest standard of equipment. They require a much wider scope of renovation and

modernisation work than the one offered by the thermal modernisation project. Therefore, although it is required that after the completion of works, these buildings meet modern energy saving requirements, in the case of renovation projects, these savings are a necessary condition, although they do not constitute the primary objective.

Projects designed to renovate or extend individual residential premises or to extend a building are not eligible for this type of grant.

Projects that are eligible for funding under the Renovation Grant Scheme include:

- Renovation of multi-apartment buildings;
- Replacement of windows and/or renovation of balconies in multi-apartment buildings (even if the balconies are used exclusively for the owners of premises);
- Alterations to multi-apartment buildings to improve their condition;
- Furnishing multi-apartment buildings with the installations and devices required for completed modern residential buildings, in accordance with technical and construction regulations.

Renovation grants are only granted to natural persons, housing communities with a majority share of natural persons, housing co-operatives and social housing associations.

Renovation grants are awarded as:

- A fixed percentage (20%) of the total value of the loan taken out by the applicant from a retail bank to finance the implementation of their renovation project – effectively reducing the amount of the loan that has to be repaid;

so long as that amount is not more than:

- 15% of the total implementation cost of the renovation project.

If, however, there are non-residential premises in the multi-apartment building that is the subject to a renovation project, the value of the grant awarded will be lower. That value will be proportionate to the share of the usable floor area of the apartments in the usable area of all premises in the building. Applicants are required to take out a bank loan to cover at least 75% of the total project implementation cost, if they are unable to cover that cost with their own funds. The grant payment process is the same as for the other grant schemes – BGK pays the grant directly to the financial lender, thereby reducing the outstanding (repayable) value of the applicant's loan.

Compensation grants⁸ ...

... are part of the compensation mechanism to help limit the financial loss that multi-apartment building owners may incur when undertaking thermal modernisation or renovation work on their buildings, as a result of the regulated rent scheme.

Regulated rent requires landlords to maintain typically lower levels of rent to ensure affordability of housing for those on lower incomes. Where a building owner/landlord invests in building improvements and is unable to reflect that investment in rent increases, due to rental price controls, he or she may apply for a compensation grant to help cover the loss incurred.

Compensation grants are available to the owners of a residential building or part of a residential building, as of 25 April 2005. Depending on the nature of the application, the value of the grant can vary. It is broadly determined according to a number of factors, such as the usable floor space of the accommodation unit (e.g. apartment), the number of those premises in a building, and the time during which the owner has owned the building (or part of it).

2.

Achieved or expected results

Table 1 shows the initial results of the TMF scheme. It started slowly and it was not until 2003 that there was a sizeable jump in the number of applications submitted, up almost three times higher than the year before. Importantly, relatively few grants were paid out in the early years, compared to the number of grants awarded. Early stage issues appear to have influenced these results (procedural issues, delays, etc.).

In the first five years, the TMF application success rate was 76% and the percentage of grants paid out was 63%. The average value of a TMF grant award was EUR 8,577.

Table 1: TMF results, 1999-2003

	1999	2000	2001	2002	2003
N° of applications submitted	144	303	191	325	890
N° of grants awarded	71	235	157	286	668
Grants awarded (EUR '000)	247	897	933	3,032	7,045
Grants awarded (PLN '000)	1,061	3,859	4,014	13,042	30,304
N° of grants paid out	3	38	107	244	499
Grants paid (EUR)	4	112	599	1,913	4,556
Grants paid (PLN '000)	19	482	2,578	8,230	19,597

Source: BGK, 2019⁹

The results for the second five-year period are shown in Table 2. In that period, the application success rate was 94% and the percentage of grants paid out stood at 80%. The average value of a TMF grant award was EUR 13,752.

This was a noticeable improvement in comparison to the five previous years, with the figures for grant applications received, grants awarded and grants paid out increasing significantly over the period.

Table 2: TMF results, 2004-2008

	2004	2005	2006	2007	2008
N° of applications submitted	1,413	1,871	3,214	3,314	2,859
N° of grants awarded	1,152	1,947	1,812	4,201	2,759
Grants awarded (EUR '000)	13,612	26,905	25,579	57,620	39,534
Grants awarded (PLN '000)	58,554	115,737	110,033	247,860	170,062
N° of grants paid out	968	1,536	1,781	2,021	3,213
Grants paid (EUR)	10,016	18,101	24,753	27,122	43,564
Grants paid (PLN '000)	43,084	77,863	106,479	116,669	187,396

Source: BGK, 2019¹⁰

The results for the third five-year period of the TMRF Scheme are shown in Table 3. In that period, the application success rate was 90% overall (92% for thermal modernisation grants, 91% for renovation grants and 78% for compensation grants). The percentage of grants paid out was 106% overall (111% for thermal modernisation grants, 82% for renovation grants and 63% for compensation grants). The average value of a TMRF grant award amounted to EUR 12,286 overall (EUR 11,895 for thermal modernisation grants, EUR 11,172 for renovation grants and EUR 34,474 for compensation grants).

The high level of grant payment observed is linked to the completion of projects that were approved for funding under the TMF and TMRF schemes.

Table 3: TMRF results, 2009-2013

	2009	2010	2011	2012	2013
N° of applications submitted	3,463	3,813	3,804	4,251	1,501
Thermal modernisation grant	3,363	3,168	3,007	3,328	944
Renovation grant	99	587	675	766	343
Compensation grant	1	58	122	157	214
N° of grants awarded	3,332	3,369	4,135	3,603	1,348
Thermal modernisation grant	3,267	2,823	3,412	2,859	869
Renovation grant	65	520	657	658	313
Compensation grant	0	26	66	86	166
Grants awarded (EUR '000)	45,731	37,588	47,635	43,235	19,771
Thermal modernisation grant	45,002	31,008	37,814	32,411	11,142
Renovation grant	728	5,987	7,317	7,391	3,300
Compensation grant	0	593	2,504	3,433	5,329
Grants awarded (PLN '000)	196,717	161,691	204,909	185,980	85,047
Thermal modernisation grant	193,584	133,384	162,663	139,419	47,929
Renovation grant	3,133	25,756	31,473	31,793	14,195
Compensation grant	0	2,551	10,773	14,768	22,923
N° of grants paid out	3,095	3,450	3,442	3,627	3,076
Thermal modernisation grant	3,086	3,302	2,969	2,975	2,333
Renovation grant	9	147	434	595	624
Compensation grant	0	1	39	57	119
Grants paid (EUR '000)	41,445	39,613	37,375	40,569	37,296
Thermal modernisation grant	41,369	38,225	32,281	32,147	27,060
Renovation grant	76	1,362	4,160	6,412	6,495
Compensation grant	0	27	935	2,010	3,742
Grants paid (PLN '000)	178,281	170,402	160,773	174,511	160,433
Thermal modernisation grant	177,954	164,429	138,859	138,284	116,400
Renovation grant	327	5,858	17,893	27,581	27,938
Compensation grant	0	115	4,021	8,646	16,095

Source: BGK, 2019¹¹

The number of applications submitted and grants awarded fell sharply in 2013, following over a decade of annual growth (TMF & TMRF). As the single largest recipient of EU structural and cohesion funds (EUR 67 billion) from the 2007-2013 budget, Poland was able to increase public investment each year through that period, despite the financial crisis¹². However, with funds from that budget coming to an end in 2013, the government was unable to sustain the investment levels of the previous years.

The results for the second five-year period of the TMRF Scheme are shown in Table 4. In that period, the application success rate was 94% overall (96% for thermal modernisation grants, 96% for renovation grants and 80% for compensation grants). The percentage of grants paid out stood at 90% overall (91% for thermal modernisation grants, 86% for renovation grants and 91% for compensation grants). The average value of a TMRF grant award amounted to EUR 13,112 overall (EUR 12,188 for thermal modernisation grants, EUR 10,149 for renovation grants and EUR 31,709 for compensation grants).

Table 4: TMRF results, 2014-2018

	2014	2015	2016	2017	2018
N° of applications submitted	3,688	3,019	2,811	2,609	2,101
<i>Thermal modernisation grant</i>	2,697	2,106	1,739	1,595	1,288
<i>Renovation grant</i>	786	709	768	757	607
<i>Compensation grant</i>	205	204	304	257	206
N° of grants awarded	3,398	3,160	2,630	2,635	1,981
<i>Thermal modernisation grant</i>	2,472	2,271	1,697	1,632	1,233
<i>Renovation grant</i>	741	691	687	779	584
<i>Compensation grant</i>	185	198	246	224	164
Grants awarded (EUR '000)	43,130	41,424	35,403	35,310	25,728
<i>Thermal modernisation grant</i>	30,509	27,364	20,532	20,517	14,486
<i>Renovation grant</i>	7,297	6,814	6,788	7,994	6,447
<i>Compensation grant</i>	5,323	7,247	8,083	6,799	4,795
Grants awarded (PLN '000)	185,528	178,192	152,292	151,892	110,673
<i>Thermal modernisation grant</i>	131,240	117,708	88,319	88,257	62,315
<i>Renovation grant</i>	31,390	29,311	29,201	34,388	27,731
<i>Compensation grant</i>	22,898	31,173	34,772	29,247	20,627
N° of grants paid out	1,989	2,830	2,787	2,480	2,278
<i>Thermal modernisation grant</i>	1,381	2,030	1,980	1,611	1,443
<i>Renovation grant</i>	431	627	639	646	649
<i>Compensation grant</i>	177	173	168	223	186
Grants paid (EUR '000)	25,031	34,617	34,381	33,179	30,090
<i>Thermal modernisation grant</i>	15,716	23,279	22,239	19,826	17,502
<i>Renovation grant</i>	4,431	5,942	6,462	6,041	6,339
<i>Compensation grant</i>	4,884	5,396	5,680	7,312	6,248
Grants paid (PLN '000)	107,672	148,911	147,896	142,723	129,436
<i>Thermal modernisation grant</i>	67,604	100,138	95,664	85,282	75,289
<i>Renovation grant</i>	19,059	25,561	27,798	25,988	27,269
<i>Compensation grant</i>	21,009	23,212	24,434	31,453	26,878

Source: BGK, 2019¹³

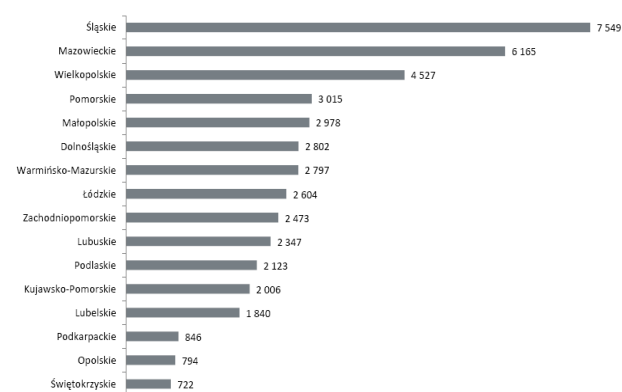
Despite the high percentages observed, there has been a gradual annual decrease in both the number of applications submitted and the number of grants awarded since 2014. The decrease has been most noticeable in applications for thermal modernisation grants, down by more than 50% in 2018, compared to 2014. Applications for renovation grants also fell by 23% in the same period and there has been a similar fall in the number of grants awarded.

The annual decreases observed appear to be linked to the TMRF receiving less government funding than previously. Poland was again the single largest recipient of EU structural and cohesion funds (EUR 86 billion) from the 2014-2020 budget¹⁴; but only 2.8% of that funding (EUR 2.2 billion) was allocated to energy efficiency in buildings¹⁵.

The results for the TMRF scheme in the period 2009-2018 show that the application success rate stood at 95% overall (97% for thermal modernisation grants, 93% for renovation grants and 79% for compensation grants). The percentage of grants paid out was 98% overall (103% for thermal modernisation grants, 84% for renovation grants and 84% for compensation grants). The average value of a TMRF grant award amounted to EUR 12,671 overall (EUR 12,016 for thermal modernisation grants, EUR 10,547 for renovation grants and EUR 32,408 for compensation grants).

Figure 1 provides a regional view of the total number of grant applications submitted. More urbanised regions with higher regional productivity (GRP) submitted more applications than more rural regions with lower GRP.

Figure 1: Number of grant applications (all types) by region, 1999-2018

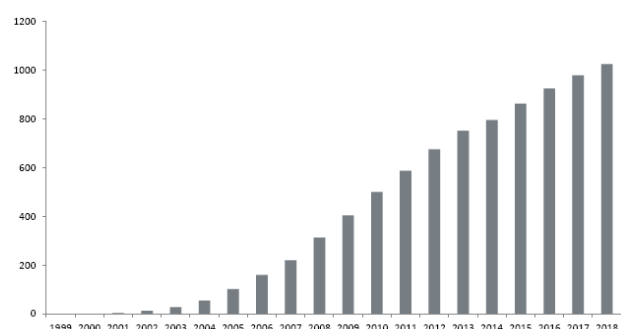


Source: BGK, 2019¹⁶

Figure 1 indicates that people living in more prosperous regions are more willing and/or able to borrow to invest in energy efficient building upgrades.

Figure 2 shows that, after a slow start, thermal modernisation projects funded by the TMF and TMRF schemes have helped to achieve a cumulative energy cost saving of approximately EUR 234 million (PLN 1 billion) by 2018.

Figure 2: Cumulative energy cost savings of thermal modernisation projects, 2009-2018 (PLN million)



Source: BGK, 2019¹⁷

Most recently, the government has introduced new legislation that impacts the TMRF scheme. The Amendment to the Act on Support for Thermal Modernisation and Renovation (2018) has broadened the scope of TMRF grant funding. The

scheme now offers additional grant funding for housing cooperatives, housing communities, housing associations (TBS) or municipalities. The funding must be used to carry out building insulation work and must be financed with a loan supported by the TMRF¹⁸.

Municipalities, housing cooperatives, housing communities and social housing associations that intend to carry out thermal upgrades to buildings are also now able to receive a grant of 16% of the total investment cost. If they install photovoltaic panels, wind turbines or hybrid solutions with an output of at least 6kW, together with insulation, the grant will amount to 21% of the total cost of the thermal upgrade, including the purchase and installation of renewable energy source (RES) solutions¹⁹.

Similar support is also available to natural persons that intend to install a micro RES installation with an output of at least 1kW, in conjunction with the insulation of a single-family house²⁰.

The budget allocated to the TMRF for the next decade (2020-2029) will amount to EUR 746 million (PLN 3.2 billion)²¹. EUR 513 million (PLN 2.2 billion) of that funding relates to investments covered by the Amendment to the Act, of which 70% will go to municipal governments²².

3.

Perspectives and lessons learned

The number of thermal modernisation and renovation applications funded have been relatively low when compared to the number of people living in sub-standard housing conditions.

The number of thermal modernisation applications funded over the last decade have ranged between 1,000 and 3,400 per year over the last decade. The number of renovation grant applications have not succeeded in surpassing 1,000 per year. By comparison, the National Housing Programme (Narodowy Program Mieszkaniowy²³), which defines Poland's housing policy to 2030, has targeted the need to improve the living conditions of at least 2 million people (reducing the total of 5.3 million down to 3.3 million) over the next decade.

There is hence a very large gap between the achievements of a scheme such as the TMRF and the targets defined in the Housing Policy. The comparison is even starker when one takes into account that there were 14.4 million homes in Poland in 2017²⁴, according to statistics compiled by the European Central Bank, two-thirds of which were built before 1980 and the majority of which are poorly insulated²⁵.

The numbers of renovation grant applications and awards under the TMRF are particularly low, when compared to the number of thermal modernisation grant applications and awards.

The main reason is that the required scope for a renovation project is much more extensive than a thermal modernisation project, with considerably greater associated costs. Renovation projects therefore require a considerable financial commitment, which relatively few building owners are willing or able to take. The size of the loans that owners would need to take out to carry out such a project vastly outweigh the amount of grant funding available to support this type of activity.

The amount of funding allocated to the TMRF scheme is significantly lower than what is needed to support the level of thermal modernisation and

renovation work that the national housing stock requires.

In fact, this issue applies more broadly to schemes in Poland that target energy efficiency improvements in buildings. The Buildings Performance Institute Europe (BPIE) estimates that a total annual investment of EUR 5.3 billion is required to enable the renovation of 50% of the current Polish building stock over the next 20 years. That would require an increase of over 1.5% in the current renovation rate of floor area per year (up from less than 1% to 2.5% per year). The BPIE contends that a re-allocation of funds sourced from the EU and other financial institutions (e.g. EBRD, EIB, World Bank) is needed to achieve the required renovation rate²⁶.

There is a significant disparity among the numbers of grant applications submitted to the TMRF scheme by owners in more urban areas compared to rural areas.

This indicates that the financing conditions attached to loan and grant funding through the scheme are perhaps more acceptable and/or relevant to owners living in wealthier parts of the country.

Recent TMRF amendments, introduced through the amendment to the Act that underpins the scheme, may help increase TMRF impact. The hope is that they will encourage local government owners and co-owners of residential buildings, to undertake renovation projects.

According to the President of the National Fund for Environmental Protection and Water Management, many residential buildings are jointly owned by the local (e.g. municipal) government and private individuals. This joint ownership model has created difficulties when trying to fund necessary renovations. Whereas housing communities, which typically manage those types of buildings, have had access to TMRF funding for a long time, local governments did not benefit from such an access. In fact, local governments have often shown a lack of

interest in investing in buildings that are 100% composed of communal flats. The amendments to the TMRF scheme now provide a support

instrument to encourage local government investment²⁷.

4.

Conclusion and recommendations

Following a slow start in its early years, the initial TMF scheme managed to support a total of 13,288 grant applications between 1999 and 2008. The TMRF scheme had successfully supported a total of 29,591 grant applications by 2018, out of a total of 31,060 applications received – a 95% application success rate. 76% of the grants awarded were for thermal modernisation projects and 19% were for renovation projects. Compensation grant awards accounted for 5% of the total.

In total, the two schemes (TMF & TMRF) combined have supported a total of 42,879 grant applications. Despite the overall application success rate (over 90%), neither scheme has managed to attract the interest of enough residential building owners to effectively tackle the renovation and energy efficiency challenge.

Approximately half of the 4.4 million homes in Poland are in need of renovation and/or energy efficient upgrades. There is therefore a considerable gap between the goals, capacity and achievement of a scheme such as the TMRF and the required level of investment and support needed to address the issue of housing and energy efficiency renovation.

The TMRF scheme is set to continue throughout the next decade with a budget of EUR 746 million (PLN 3.2 billion) for the 2020-2029 period. However, this level of funding is limited in comparison to the EUR 5.3 billion that is estimated to be needed on an annual basis to fully renovate 50% of the national housing stock over the next 20 years, according to estimates from the Building Performance Institute Europe.

Looking forward, three recommendations are suggested to help improve the impact of the scheme:

- Significantly higher levels of annual investment are needed to support building renovations and to improve building energy performance;

- Funding should be maximised by making use of a range of financial instruments, including the use of higher leverage instruments;
- More flexible financing solutions are needed to attract more applications from less represented areas. To encourage more building owners in poorer (e.g. rural) regions, consideration should be given to varying the grant-loan ratio, to reduce the loan funding burden for potential applicants that cannot afford the standard level of commitment.

Overall, the TMRF is rated as a '3-star good practice measure' on a scale of 1 (low) to 5 (high).

This score is based on the fact that the scheme has been running for a long period of time with a relatively stable number of applications received and funded, and an application success rate of more than 90% overall. The TMRF score does not exceed 3 stars however, because overall participation in the scheme has been relatively low compared to the number of homes that are in need of renovation and improved energy efficiency.

The TMRF is rated as a '3-star transferable measure' on a scale of 1 (low) to 5 (high).

This score is based on the fact that the scale of the investment needed to make this type of measure a real success is very sizeable and difficult to achieve. It is therefore an important consideration when assessing its potential for replication in another country. This type of grant and loan measure, implemented and supported by a national development bank, is already in operation in other EU countries. Therefore, elements of the measure are certainly transferable to countries that do not yet have similar measures in place. However, the national context is a key factor to consider, so it would have to be carefully tailored to local needs.

Endnotes

- 1 Law of 21 November 2008 on supporting thermo-modernisation and renovation:
<https://www.lexlege.pl/ustawa-o-wspieraniu-termomodernizacji-i-remontow/>
http://orka.sejm.gov.pl/proc6.nsf/ustawy/321_u.htm
- 2 Bank Gospodarstwa Krajowego (BGK), Termomodernizacja sposobem na miliardowe oszczędności, 13 December 2018:
<https://media.bgk.pl/46287-termomodernizacja-sposobem-na-miliardowe-oszczednosci>
- 3 iBROAD Country Factsheet Poland 2018:
http://bpie.eu/wp-content/uploads/2018/01/iBROAD_CountryFactsheet_POLAND-2018.pdf
- 4 Financing Low Carbon Refurbishment, National financing supporting schemes for energy efficiency in buildings, page 8:
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- 5 Ministerstwo Inwestycji i Rozwoju, Wspieranie termomodernizacji i remontów:
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- 8 Ibid
- 9 BGK, Dane liczbowe Funduszu Termomodernizacji i Remontów, Feb 2019:
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- 10 Ibid
- 11 Ibid
- 12 London School of Economics (LSE), After years of above average growth, Poland now faces the spectre of recession, July 2013:
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<http://bpie.eu/wp-content/uploads/2018/06/merged-1.pdf>
- 16 BGK, Dane liczbowe Funduszu Termomodernizacji i Remontów, Feb 2019:
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- 17 Ibid
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