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REELIH
RESIDENTIAL ENERGY EFFICIENCY FOR LOW-INCOME HOUSEHOLDS

RECOMMENDATIONS FOR ARMENIA AND BOSNIA & HERZEGOVINA ON ENCOURAGING ENERGY EFFICIENT RENOVATION OF THE MULTI-FAMILY HOUSING STOCK

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Residential Energy Efficiency for Low-income Households project is one of the many assistance projects supported by the American people through the United States Agency for International Development (USAID). Since 1992, the American people through USAID have provided a broad range of development programs in Armenia and Bosnia and Herzegovina, shifting from an initial humanitarian emphasis to assistance for economic, political and social transition.

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1 INTRODUCTION

Metropolitan Research Institute (MRI) was contracted by the REELIH (Residential Energy Efficiency for Low-income Households) project to provide research assistance to the practical work that is being conducted from 2013 in Armenia and in Bosnia & Herzegovina. In both countries the goal of REELIH is to show by means of pilot projects that the energy efficient interventions in multi-unit residential buildings are possible and worth to implement. Based on the experiences of the pilot projects advocacy activities are being carried out in order to change the legal framework and to influence the institutional settings and the behaviour of the actors, thus to establish a sustainable renovation system. MRI – based on the experience it had on the housing policies of the Central and Eastern European countries – was contracted to assist the field research and formulate suggestions both concerning methodological issues and the focuses of the advocacy activities. The current report aims to support with facts and arguments the advocacy work of the local REELIH project managers towards the creation of this sustainable and effective renovation scheme.

In the framework of the REELIH project the experience of the Central Eastern European (CEE) countries has been studied by MRI with the aim of providing lessons for both BiH and Armenia. (The study on the detailed analysis of the CEE subsidy schemes was completed in September 2015.) The CEE region was selected based on the conviction that the common Socialist path and the ensuing regime change had such an influence on the development of the housing sector that despite the differences with Armenia and BiH there is enough common ground to pursue a more detailed study of the different subsidy schemes financing energy efficient interventions in the residential sector. The exact countries were chosen keeping in mind to provide an ample variety of experiences of how countries with a common heritage but with a somewhat different wealth and priorities can proceed with the energy efficient refurbishment of their respective housing stock. Thus the different countries display different strategies with regard to the exact target group of their programs, the expected results and the amount and way the subsidies are provided. The selected CEE countries were Hungary, Poland, Slovakia and Romania, with a short summary of the Croatian and Lithuanian experience.[1] Although all countries are members of the EU now, allowing them to devote EU funding for the financing of such interventions, they provided national resources to finance the interventions when they started their programs.

Whereas for the CEE analysis local stakeholders were approached and interviews conducted, the analysis in preparing a state-of-the-art for BiH and Armenia is based on a brief field visit in both countries with interviews conducted, and materials provided by the REELIH project, based on the field work of local HfH Armenia in Armenia, ENOVA in Bosnia & Herzegovina and other subcontracted experts and companies. These materials included surveys about the housing stock, the attitude of the residents, the opinion of the property managers and very importantly the rapid assessment report on both countries. Furthermore, a desktop study was conducted to supplement the information provided and to acquire the most up-to-date data available.

The aim of the current report is to summarize the most important lessons learned from the CEE experience, and based on these to offer a set of recommendations for Armenia and Bosnia Herzegovina for the development of a national subsidy system for energy efficient interventions into the multi-apartment stock in the residential housing sector that is both sustainable and has

[1] The overview of the Croatian and Lithuanian experience is included only in the detailed report on the subsidy schemes applied in some of the CEE countries and not incorporated into this report.

measurable effects. In the following, after the executive summary, the report first provides an overview of the housing and energy system of Armenia and Bosnia & Herzegovina. Then it overviews the most important, country specific lessons learned from the CEE countries studied in short. Finally, after reviewing the most important barriers to transferring knowledge between different countries, it creates a list of recommendations both for Armenia and Bosnia & Herzegovina.

In creating this report, many have helped the researchers of MRI. We are especially indebted to Karen Asatryan, Hasmik Paytyan and Luiza Vardanyan for organising our Armenian field trip and providing constant help and support. For our Bosnian trip we would like to express our heartfelt thanks to Arnesa Borčak, Samir Bajrovic and Jasmin Gabela for the organisation. Finally, Zita Kakalejcikova and Alina Muzioł-Węcławowicz have provided invaluable help for understanding the CEE subsidy systems and finalizing the country studies.

2 EXECUTIVE SUMMARY

Understanding the possibilities of creating an energy efficient investment program for the residential housing stock in Armenia and Bosnia & Herzegovina (BiH) has important political and economic implications for both countries. First and foremost a well-functioning national scheme would allow them to alleviate the often dire living conditions many households experience, by improving their direct surroundings and decreasing the costs of using energy on the long run. It also means that the countries themselves can ease their energy dependency; sparing budgetary sources often spent on general energy price subsidies and get more room for manoeuvring in negotiations with energy supplying countries in case their own energy resources don't suffice.

However as long as the energy efficient interventions are not implemented on a large scale and produce a volume effect these positive impacts can hardly be seen. Energy efficient interventions in the first period mean extra costs for the inhabitants and the public sphere, and problems to solve like the question whether there are enough incentives for all actors to start participating in the process.

Both Armenia and Bosnia & Herzegovina have a set of strengths and weaknesses that promote or inhibit the introduction and the maintenance of such large scale programs. The most important ones are the following:

Armenia's strengths:

- The bank sector is well developed in Armenia and there are a lot of different green funds available.
- The legislation on Home Owners' Association (HOA) is relatively well elaborated: there are still important changes on the agenda, but the main rules are set. This legislation creates HOAs that consists of several – mostly dozens of – buildings. By the law these HOAs are capable to operate, manage the buildings with their own more or less professional management bodies, and implement renovation projects.
- There is already a cooperation established between Habitat for Humanity Armenia and the institutional actors (ministries, municipalities, financial institutions) to advocate the desired changes in the institutional and legal system.
- There is already a municipality (the Yerevan municipality) that provides assistance and financial aid for renovation of multi-family buildings for years.
- The system of public administration is structured in a way that it allows for a national subsidy scheme to be introduced with a strong role of the local municipalities.
- Given that heating is almost exclusively done on a dwelling basis, all housing units can regulate their exact energy consumption. Thus any energy efficient intervention can have a prompt impact on consumption and the yield savings right away.

Armenia's weaknesses:

- The GDP level of Armenia is low compared to the European countries (appr. 3100 EUR/capita in 2015 – reported by the World Bank).[2] About 30-35% of the inhabitants live under the poverty line. These facts result in serious difficulties in generating the upfront costs and the interim payments of the energy efficient interventions, even in case of heavy subsidies.

[2] http://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=AM

- The physical state of the multi-family buildings is generally bad due to the lack of maintenance. The buildings have serious deficiencies besides their weak energy efficient parameters that often might take precedence in urgency to renovate.
- Energy prices – even though they were increased substantially in the 2000s, and make up a significant share of households' expenditures – are still lower than in the countries with serious energy efficiency intervention programs in the Central and Eastern European region. The current price level contributes to decreasing private interest in the participation of an EE program.
- Even if the legal background of Home Owners' Association is more or less stable, relevant share of the buildings – mostly outside of Yerevan - do not register themselves as HOAs as do not have the financial and operational capacity to act as a real HOA.
- The fact that many HOAs consist of several buildings created such a situation where the residents and their representatives cannot easily control the HOA management, unless they are really active. There are advantages of a condominium/cooperative structure consisting of several buildings (like greater financial reliability, bigger professional management capacity). However, such big organisations can hinder the involvement of individuals in the decision making processes, diminishing the possibility of creating an active community. Furthermore in the current HOA structure individual buildings (within a larger HOA) can't have their own bank account thus cannot implement financial operations separately from the other buildings.
- There is a general lack of trust and transparency surrounding the operation of the HOAs, resulting among others in very low collection rates of the maintenance fees.
- Even if there would be a possibility to provide proper commercial funding for HOAs based on the current legislation, the general financial framework e.g. the high interest rates and the uncertainty of the exchange rate of the AMD, create strong financial barriers.

Bosnia & Herzegovina's strengths:

- BiH has a stable banking system mostly based on international actors. The country experiences low inflation and relatively low interest rate levels. Based on these foundations individual housing finance is a common practice: bank finance in case of borrowers with formal income and micro-finance institutions in case of uncertain income flow.
- There are already examples of buildings that underwent significant renovations including the insulation of the walls and roofs. It is very common among the owners that they change the windows of their apartments individually, taking credits if necessary.
- There is a domestic industrial background for energy efficient construction materials and the expertise of implementing energy efficient interventions is also available.
- The country has strong ties to the European Union, which means both funding and energy efficiency requirements.
- ENOVA elaborated an Action Plan for the energy efficient renovation of the housing stock for TUZLA Canton, which was accepted by the cantonal council on the 14 of September 2016. In addition to that the Canton devoted approximately €0.5 million to encourage the further elaboration of the renovation scheme and the start of a subsidy programme.

Bosnia & Herzegovina's weaknesses:

- The nominal GDP level of the country (3,642 euro/head in 2014 according to the Bosnian Statistical Office) is significantly less than that of the CEE countries when they started their energy efficient renovation activities. The average nominal income level (app 450 Eur/month) is comparable to that of Romania and Hungary but due to the high unemployment level (44% in 2013-2014) the average income of households (mainly if there are no officially employed members of them) is significantly lower, not providing proper background for renovations.

- The energy prices (except for natural gas, which has a marginal share in the energy consumption) are relatively moderate in Bosnia, which still result in serious housing expenditures but also result in relatively long pay-off periods of energy efficient interventions.
- About half of the multi-family housing stock is district heated (nearly half of these buildings are located in Sarajevo) and the consumption is mostly not metered neither by apartment nor by building. That is why any energy efficient intervention cannot be reflected automatically in energy savings.
- The legal background (and rather the practice how it is implemented) of the operation of HOAs does not provide a proper framework for renovation activities in the Federation. HOAs are not legal entities and the decision on renovation, in case all the owners contribute to the financing, requires 100% consensus. The lack of legal entity is considered by the banks as an exclusion criterion for having a bank account and consequently HOAs are too dependent on the maintenance companies, operating through them. (The situation is somewhat different in Republika Srpska where HOAs are legal bodies.)
- The HOAs are organised on a staircase basis, thus one building can include several HOAs which helps in case of decision making (as there are fewer members of the HOAs) while results in technical complications when only part of the building is renovated.
- The administrative system of BiH is fragmented including the two Entities (Federation of Bosnia and Herzegovina (FBiH); Republika Srpska (RS)) and Brcko district. In addition to that there are 10 Cantons in the Federation which is divided further to municipalities and cities. This fragmented administrative system also results in different legislative background in different locations. Under the current status quo it seems difficult to change, thus there is little hope to introduce national energy efficient programs, but these programmes can rather be designed on entity, cantonal or local level.

Even if Armenia and Bosnia & Herzegovina differ from the Central Eastern European (CEE) countries in many respects, the schemes that have operated for decades to subsidize energy efficient interventions in multi-family buildings in the CEE countries can provide lessons and yield important information for setting up their Bosnian and Armenian counterparts. Especially that all studied CEE countries have an important socialist heritage that they share with BiH and Armenia: the privatised multi-family housing stock with strong technically similarities as a result of the mass housing constructions starting from the 1960s, typically consisting of pre-fabricated estates.

The energy efficient subsidy schemes applied in the CEE countries, with the primary aim of refurbishing the prefabricated housing stock have important common characteristics, but – as Table 1. highlights - are also divergent with regard to the subsidy amount, target group or the method of acquiring these subsidies.

The subsidy schemes were introduced mostly at the turn of the millennium (except for Romania, that planned to introduce a subsidy system in 2002 but as it was not successful it was re-launched again under different conditions in 2009). The reasons behind are that by the turn of the century the market transition in the countries were more or less completed, the multi-unit housing stock was privatised, the HOA legislation was strengthened and the market based services (e.g. financial institutions, management services) were stabilised. And after the GDP decline of the 1990s a significant economic growth was experienced. These were the necessary preconditions for creating the subsidy schemes that by 2015 affected about 15-25% of the multi-family housing stock in the four countries all together.

This ratio might be even higher in Slovakia and Poland, where some surveys suggest that the renovated multi-family housing stock can reach up to 50%, meaning that a significant share of the stock was renovated without subsidies, only using financial products offered by the banks. This is in connection with the fact that in both countries the subsidy scheme has been mostly based on loan

schemes (interest rate subsidies and bonus tied to commercial loans), with low subsidy content. Thus, there is not too much difference between the subsidised projects and the non-subsidized ones. On the other hand the grant based schemes (Hungary, Romania and Slovakia mostly in the early 2000s) applied quite high subsidy rates – ranging between 50 and 90%. Besides accelerating the renovation activities, these grant subsidies had the perverse effect of increasing the construction prices in case of subsidized projects and often ignoring the quality parameters (as residents who risked less did not care much about the quality). The requirements concerning the energy saving content of the interventions increased as time went by, starting from no exact requirements and reaching 25-40%. These requirements were further strengthened by the effects of the EU accession and the compulsory implementation of directives regarding energy efficiency.

Table 1: Basic data of subsidy schemes in four Central Eastern European countries up to June 2015

	Hungary	**Poland**	**Romania**	**Slovakia**	
Main subsidy form	Panel programs	Thermo-modernisation program	Thermo-modernisation program from state and EU sources (parallel schemes)	Loan from the State Housing Development Fund	Grant from the Ministry of Transport
Subsidy content	Initial setup: 33% state, 33% municipality Current setup: 50% state and optional municipal	Bonus tied to commercial loan not exceeding 16% of the renovation costs and 20% of the loan amount	Initial setup: 1/3 state, 1/3 municipal, 1/3 owners. Current: 50% state, 30% municipal grant, OR 60% state and EU + 10-30% municipal grant	Preferential interest rate 0-1.5%	Initial: 30-50% grant Current: 70% (limited scope of intervention)
Targeted housing stock	Initially: buildings with industrialised technology, Current: all multi-family buildings Small scale programs for family houses	Both multi-family buildings (built before 1989, later extended to 2002) and family houses	Multi-family buildings built between 1950-1990	Both multi-family and family houses	Multi-family buildings
Number of dwellings affected by the main subsidy schemes[3]	appr. 350,000 units	appr. 27 600 buildings	appr. 110.000 units	appr. 150.000 units	appr. 150.000 units
Funds spent on the main subsidy programs	€ 300 million (for the state grant excluding municipal contribution)	€ 350 million (for the bonus given to the loans)	€ 247 million grant (state +EU) excluding the municipal contribution	€ 110 million	€ 650 million for loan (state + EU)
Additional subsidies for the renovation of multi-family buildings	Interest rate subsidy (75%, 35%), Contract savings (Bausparkasse), Regional Operational Program, Local municipal programs	Regional Operational Program		Contract savings (Bausparkasse); EBRD loans	

Source: Gerőházi, Éva, Szemző, Hanna (2015) p. 14

It has been a general pattern that it took about 3-5 years for all subsidy schemes to become popular. This might have happened partly because of the conditions were not ideal (like the relatively high share of necessary own share for the grant scheme in Slovakia, or a loan scheme without proper

[3] We should not jump to conclusions about the share of renovated dwellings based on the number of subsidized interventions. In most subsidy schemes home owners' associations could apply for subsidies multiple times in the last decades, so the statistics probably hide an important number of overlaps.

banking projects in Poland, or the lack of co-financing for grants in Hungary) but also because of the lack of awareness about the funds, often coupled with caution with new endeavours among building residents. The breakthrough in all countries happened when commercial banks were able to offer proper financing based on the cash-flow collateral of HOAs, and issuing joint loans became an everyday practice. By this mean there was no need for individual collaterals anymore and the whole decision making and underwriting procedure became much less complicated. These new commercial bank products made the loan schemes operate and provided co-founding for HOAs to obtain grants. Guarantee schemes in some countries helped the process of establishing the trust of the banks (like in Hungary), however they were unsuccessful in Slovakia and Romania where they were too complicated to utilise. ESCO type interventions were and still remain quite rare in these countries regarding the residential sector as there has been no need for third-party financing and performance guarantee is not an important product for the inhabitants. (Also the ESCO companies prefer other sectors than the residential one.)

All subsidy schemes had and still have relatively high transaction costs as the energy audits, the elaboration of the documentation and quality control result in significant costs together. This is coupled with the already mentioned minimum requirement concerning the energy savings and the requirements concerning the own share/the creditworthiness of the HOA. All these parameters show that the subsidy systems were designed to reach the low to high middle income layer of the society but definitely not the really needy families. In spite of that no real individual social targeting was built in these schemes (only Romania tried to provide higher subsidies to buildings with lower income families but this system turned to be unsuccessful because of the too high administrative requirements). Rather, some sort of group targeting was applied: a segment of the housing stock was defined - mostly multi-family buildings built with mass construction technologies – and it was assumed (rightly) that most residents were around middle income, thus most wealthy households were excluded from the subsidy scheme.

Based on these experiences of the CEE countries, the following suggestions can be formulated for Armenia and Bosnia & Herzegovina.

Suggestions for both countries:

- First it should be stated that in both countries the energy efficient interventions are in an introductory phase (if at all) which means that the main aim is to enter the market and lower the already existing barriers. Based on the experience of the CEE countries it cannot be done by means of targeting the schemes to the neediest households first as it is still enough complicated to involve middle-income families into the renovation schemes. There is a general problem with the limited access to proper financing which is not only the problem of the neediest but also the problem of the middle class. Thus the mission of Habitat in both countries can be to ‘break the ice’ and create a sustainable institutional framework that on a longer run (when the energy efficient renovation may be a more common activity) may lead to more emphasis on low income households.
- The introduction of a grant scheme with a subsidy content of 40-60% is essential to upscale the renovation activities. (The subsidy content is higher in Romania but quite complex interventions are requested in return.) Theoretically it is possible to introduce revolving funds as well, but as lending mechanisms to HOAs are very weak in both two countries repayable systems would not have significant effect. In order to avoid the perverse effects of subsidies (e.g. price increase and ignorance of quality) strict price and quality check should be built in the system, despite its relative high costs.

- Sharing the subsidies between the different administrative layers like state/entity/canton/municipality is advisable. By this mean the financial burden is also shared, allowing for a relative decentralisation and greater mobilisation power 'on the ground'. However it must be ensured that the sharing of co-financing would not result in the duplication of administration.
- Keeping down the required level of interventions for the introductory period of the subsidy scheme, dropping requirements for complex interventions and supporting smaller steps instead is suggested. Preference should be given to those ones that cause not only energy but structural problems (like facades). It is also preferable if buildings have a long term renovation plan and part of it is realised by means of the subsidy paying special attention to the proper technical order of interventions.
- Forget about the individual social targeting schemes as of now as they are time and money consuming and quite misleading in countries with high level of illegal income and significant remittances. Taking into account that both countries have a high rate of poverty and the household income levels are generally low, it is less risky to provide 'extra' subsidy for a bit better off families than to paralyze the subsidy scheme because of individual evaluation methods. On the other hand it is possible to define that part of the housing-stock and focus the subsidies towards that, which local politics consider more vulnerable technically and socially.
- The assistance of the local municipalities is strongly required in both two countries. They can play role not only in co-financing the schemes but also raising awareness, providing trainings, elaborating technical audits and carrying out quality checks.

In addition to these general recommendations there are country specific suggestions that are based on the special circumstances of the given state. For Armenia the following specific recommendations can be formulated:

- Given the combined problem of the very low income of the families and the dire need of repair in the buildings, it is advisable to concentrate on (often smaller) interventions that are necessary to carry out but have a positive effect on the energy consumption as well. Thus, roof repairs and repairs regarding the staircase windows and the entrance doors are advisable. Furthermore, engineering problems should be paid attention too. The structure of the buildings is rather stable in the multi-apartment buildings so they can stand in the upcoming decades as well.
- The persistency of the programs is crucial – success can be achieved only if people know that a subsidy is available for a longer period of time. Then they begin to count with it, and plan their budgets accordingly. This becomes especially important in a country like Armenia, where household budgets are tight
- Complex energy efficiency programs, requiting the complete insulation of the buildings are likely to be very expensive – also as a result of the lack of expertise and expensive materials – requiring disproportionately high contributions from the public sphere. As a consequence they should not be considered at the initial stages of setting up the subsidy schemes, rather when there are specific loan products available and only if the financial stability and the general GDP level of Armenia increases substantially.
- The reform of the HOA legislation in a way would allow residents to exert their influence stronger on the management of their buildings, giving incentives to the residents to participate. This would mean ensuring that the operation of the HOAs is more transparent to the inhabitants and that the individual buildings can control and influence decisions. This also includes making it possible for individual buildings to have their own bank accounts.

- Using international donor funds to provide guarantees and cheap funds would be necessary. As the unfavourable financial conditions (high and volatile interest rates) make lending very expensive, the role of donor funds can be important here to accelerate HOA lending.

In case of Bosnia & Herzegovina the following additional suggestions can be formulated:

- On the short run it is advisable to focus on those buildings that 1) have individual heating system that can be metered, 2) have serious technical difficulties that create incentives for renovation and 3) have a creditworthy and ambitious management company that is able and willing to borrow money from commercial banks for the renovation of the buildings. As HOAs are currently not able to have their own bank account in the Federation, an intermediary should provide this service. (This activity has serious limitations, but can be used occasionally). In order to do that new financial schemes should be developed by the financial institutions (a quasi joint loan system) and HOAs and management companies should be trained and facilitated by either the local municipalities or any other organisations to obtain information, skills and willingness to start the procedure.
- Besides working with buildings that have the most renovation potential it is inevitable to work on the modification of the HOA legislation in FBiH (in the Cantons of FBiH as this type of legislation is on cantonal level) making HOAs independent actors that can enter into a contractual relation with other stakeholders. In addition to the legal entity question the HOA legislation should accept the basics of democracy: the majority (it can even be a 2/3 majority) should be able to make decisions that is compulsory for the minority even if it is about financing the renovation activities.
- It is worth working with the banks more intensively as currently they are reluctant to deal with individual HOAs even if it would be possible without solving the legal entity problem (HOAs are able to enter into contract according to the current regulations at least in Tuzla Canton as an example.) Banks do not see the market potential in this segment, but it may be the result of lack of knowledge and openness to innovation.
- More attention should be paid on working in Republika Srpska as the HOAs are legal bodies there, which means that they have more room for manoeuvre in organising, financing and implementing the renovation works. Good examples and elaborated financial schemes coming from RS would be easier to duplicate in FBiH.
- Theoretically it is possible to work out a third-party financing ESCO scheme in which district heating (or any intermediary) companies would finance and implement the renovation works and would pay it off from the energy savings gain. However such a scheme has a lot of risks that should be carefully analysed in advance. As Tuzla canton already approved an Action Plan on the energy efficient renovation of the housing stock, which is practically based on the ESCO concept, it provides a good basis for further investigation.
- In addition to that it is important to create the technical and legal background of individual metering of the buildings in order to create incentives for energy savings.

3 STATE OF THE ART

3.1 Armenia

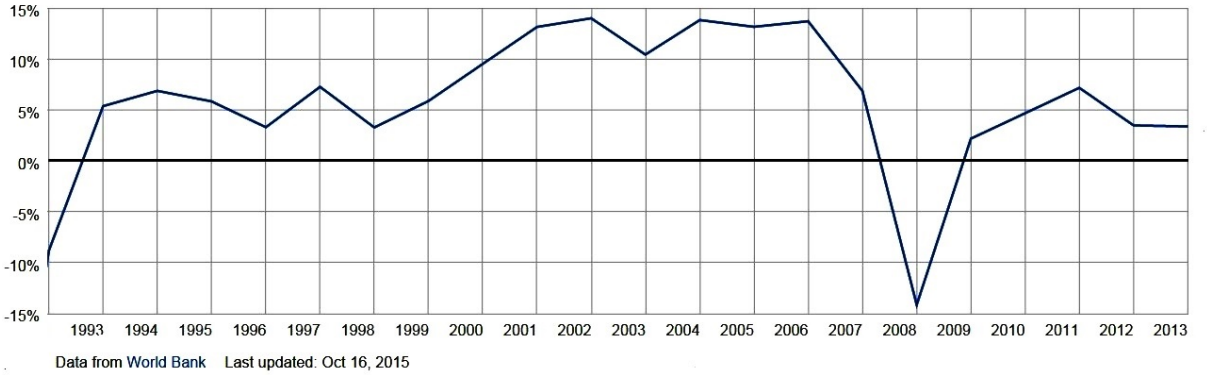
3.1.1 Background

Armenia is a landlocked country in the South Caucasus region of Eurasia. Its territory is slightly under 30,000 square kilometres; its population is approximately 3 million, which makes it the most densely populated of the former Soviet states. It is bordered by Georgia on the north, Turkey on the west, Azerbaijan on the east and south, and also by Iran on the south. According to its Statistical Yearbook from 2014 roughly one third of the population lives in the capital Yerevan, and altogether about two third lives in urban areas. It the most ethnically homogenous of the 15 former Soviet Republics with approximately 97% of its population made up of ethnic Armenians. Large Armenian diaspora populations live in the United States, France, Russia, Germany and Iran, their continuous support plays an important role in the economic life of Armenia.

Armenia declared independence from the Soviet Union on 23 August 1990, although its independence was only officially recognized in 1991, after the dissolution of the USSR. In 1991 it joined the Commonwealth of Independent States (CIS), a regional organisation whose participating countries are most of the former Soviet Republic, and is part of the CIS free trade area. In 1992, the country joined the United Nations; in 2001 it became a member of the Council of Europe and in 2003 World Trade Organisation. Armenia joined the Eurasian Economic Union upon the bloc's launch in January 2015.

According to its Constitution adopted in 1995, Armenia was a semi-presidential republic, which was converted into a parliamentary republic following a referendum in December 2015. The legislative authority is the National Assembly.

Figure 1. GDP Growth (annual change, %) 1992-2013



Source: World Bank online database

Its economic development in the 1990s was halted not only by the transitional recession and its newly declared independence (resulting in some disruption and rearrangement of trade and natural resources), but also by the Nagorno-Karabakh war lasting from the late 1980s to May 1994. The peace process with Azerbaijan, mediated by OSCE, is still ongoing, resulting in prolonged tensions between the two countries. The economies of both countries have been hurt by their inability to make

substantial progress toward a peaceful resolution. It also resulted in the influx of 350,000 refugees into the country.

The post-transitional and war recession was marked by a -41% GDP contraction in 1992; which was replaced by a prolonged double-digit GDP growth in the 2000s, lasting until 2009, when the effect of the Great Financial Crisis hit the region. Construction, retail services, mining, manufacturing, and agriculture contributed to strong growth in 2002–2008 until the onset of the global financial crisis. In 2009 country's GDP contracted by 14%, although it did begin slow recovery in the following years.

Today Armenia has a liberalized market economy. The country has a healthy level of trade with European countries, the Middle East, and the Commonwealth of Independent States. Although Armenia has great potential for renewable energy sources (most importantly geothermal, solar and wind); gas, oil and other vital supplies come from Russia and Iran,

According to IMF's 2013 data, nominal per capita GDP in Armenia was USD 3,037, and purchasing power parity per capita GDP was USD 6,128; as opposed to USD 32,498 and USD 37,607 (PPP) of the European Union in 2015.

After an economic and property price boom between 2004 and 2008, poverty started rising in the late 2000s at the effect of the Great Financial Crisis, and by 2011, around 30% of the population was living below the poverty line. According to the Asian Development Bank and the Climate Investment Funds' Country Fact Sheets (ADB, 2015), almost 30% of Armenian households spend more than 10% of their budget on energy. This means that about a third of all Armenians are energy poor.

3.1.2 Housing structure

Out of Armenia's over 3 million people 1.06 million lived in the capital city Yerevan, 122,000 in the second largest city Gyumri, and 86,000 in the third largest Vanadzor. The population of the country's remaining cities and towns does not exceed 50,000. Even so, 64% of the population lived in urban areas according to the 2011 Census.

There are approximately 18,900 multi-story apartment buildings in the country, 4,800 of which (25,4%) are located in the capital Yerevan. 4,400 apartment buildings (cca. 20% of all multi-unit buildings) are constructed of pre-fab concrete.

The rental market is relatively small, and is largely concentrated on Yerevan, where it takes up between 3-5% of the housing stock. In the early 2000s rent levels varied between USD 50 and USD 400, the former indicating the low end, and the latter the high end of the market. There is no rent control, and most leases are conducted informally. According to HFH Armenia's *Armenia Housing Study*, a social housing sector was virtually non-existent in 2010; the Rapid Assessment Report estimated that 1-2% of the housing stock remained in municipal ownership and was used for social rental housing. The Housing Study also informs that only 13% of the building stock was built before the 1950s; and the vast majority, nearly 75%, was built between the 1950s and the late 1980s. (A similar post-war mass building with a peak in the 1970s was observable also in other socialist countries, but state funded mass building was also an important phenomenon in many developed countries.)

It is important to note that a magnitude 7 earthquake in 1988 wrought massive damages to the housing stock especially in the northern part of the country, and reconstruction since then has contributed importantly to the currently existing housing stock. Importantly, the country still did not fully recover from the 1988 earthquake, in a sense that even today many people worry more about the earthquake resistance of their home than its energy efficiency.

About 12% of multi-unit buildings were constructed since 1991, with modern technologies, with a more pronounced boom in construction as well as housing prices between 2004 and 2008, with construction output increasing four-fold in the peak period (IMF, 2011); but even this rise left building output below the 1960s to 1980s values. Accordingly, it must be noted that 88% of multi-unit buildings were constructed before 1991, according to the generally low standards of the times applicable in the Soviet Union: these buildings were originally built with without insulation, and few went through major renovations ever since. Nonetheless, tuff stone is used on almost 70% of the buildings' façades, which provides good façade insulation thanks to tuff's good energy conservation properties, although it still necessitates posterior insulation of the roof, grounds, doors and windows. Furthermore, the widespread use of tuff negatively impacts the replicability of energy efficient renovation models.

In 2009, roughly 435,000 dwellings were located in multi-unit buildings and 390,000 in single family houses. The vast majority (93.6%) of the multi-unit buildings were located in urban areas. 330,000 of them (approximately 76%) were managed by a Homeowners' Association, and the rest were managed by the community of inhabitants.

The Law on the management of multi-unit buildings and the Law on condominiums were both accepted in 2002, but legal gaps with regards to the management of multi-unit buildings prevail in the legal framework. (The legislative changes are under way parallel to finishing this report.)

3.1.3 Energy provision and energy efficiency

Armenia has a markedly continental climate with hot summers and cold winters. The country is mostly located on a mountainous and highland terrain. Based on its natural resources the country has great potential in utilizing a variety of renewable energy sources, including hydro power plants, geothermal energy, and photovoltaic sources. The residential sector is one of the largest end-users of energy: 44% of electricity and 37% of heating is used by the residential sector. In 2007, USAID estimated that proper insulation could reduce residential household energy consumption by 30%, and could also significantly increase the thermal comfort of residents.

Historically, inexpensive energy resources were provided to Armenia from the USSR, and the continued provision of cheap energy resulted in a low level of residential energy efficiency. This is particularly problematic for low income and vulnerable households who suffer from wasteful energy use, but have no means of undertaking energy efficient refurbishment.

District heating once provided 55 percent of Armenia's residents with heat supply, but entirely disappeared as a consequence of the economic difficulties following the Nagorno-Karabakh conflict and the collapse of the USSR. The early 1990s economy and energy blockade against Armenia sent district heating centres bankrupt, and has led to the 1991-1996 energy crisis. Currently the residential sector is served by a diversity of heating systems: 70% of the population of multi-unit apartment buildings uses gas, 20% electric heating and 10% by biomass (wood and manure bricks). Almost all of the roughly one million households are on the electric grid, whereas only about 70% of the population have access to gas; especially small villages are left out of the gas grid. Widespread individual metering allows for near 100% collection rates, with a near complete lack of non-payment.

The Rapid Assessment Report for REELIH identified the following major energy market stakeholders:

- Armenian Electrical Network Closed Joint Stock Company (CJSC)
- Generating companies (Armenian Nuclear Power Plant CJSC, HRazdan Thermal Power Plant CJSC, Yerevan Thermal Power Plant CJSC, Sevan- Razdan Hydroelectric System CJSC, and Vorotan Hydroelectric System CJSC and other HPPs)
- High Voltage Power Grid CJSC

- Power Grid Operator CJSC
- Gazprom Armenia CJSC.

It also warned repeatedly that a sudden and drastic increase in energy prices in 2013 is expected by most interviewees. While a single drastic price raise never took place, energy service providers have seemingly kept requesting it. In June 2015 the Armenian international news site Asbarez wrote *"the single electricity distribution company in Armenia, Electric Network of Armenia, ENA, formally requested the Public Services Regulatory Commission, PSRC, to increase the price of electricity that consumers pay by 40 percent'*; which led to a series of large scale protests (Khanjian, 2015). A 2013 World Bank report on Armenian power generation tariff setting already pointed out that due to increasing natural gas price and the need to invest into the sector, a 70-270 percent end-user tariff would be needed over the next few years to finance full cost recovery in the sector (World Bank, 2013). Although no natural gas increase has taken place since 2013, until than it had been rather steep: between years 2006-2013, the price for natural gas for the population grew by 240% or by 15,7% annually. A number of sources point out that Armenia already uses renewable energy sources, particularly large hydro power plants Vorodan and Sevan, and about 150 smaller renewable energy power plants, although their output depends on annual water yield. Geothermal sources can also make an important contribution to generating the country's electricity supply on the long run, however they are just beginning to be exploited. The greatest part of electric power generation comes from nuclear plants and also natural gas-based; the combination of gas and electricity based heating means that the country is still greatly dependent on natural gas, which 100% imported from Russia and Iran.

The legal framework on energy, energy efficiency, and renewable energy comprises of (among others):

- The Law on Energy (2001)
- The Law on Energy Saving and Renewable Energy (2004)
- Energy Sector Development Strategy (2005)
- Action Plan of the Ministry of Energy and Natural Resources (2007)
- National Program on Energy Saving and Renewable Energy (2007)
- Hydropower Development Strategy (2011)
- National Energy Security Concept (2013)
- Amendment to the Law on Energy (2014) establishing mandatory off-take period of 20 years for small renewable plants

The Energy Saving and Renewables Law was adopted by the National Assembly of the Republic of Armenia on November 9, 2004. A National Program on Energy Saving and Renewable Energy of the Republic of Armenia was developed by the Alliance to Save Energy (and funded by USAID) in 2007, with the main purpose to set targets for the energy saving and renewable energy development in Armenia and to determine the means for their realization.

International treaties related to energy efficiency and environmental safetly to which Armenia is a signatory party include:

- Statute of the International Renewable Energy Agency (IRENA) (2009)
- Protocol on Pollutant Release and Transfer Registers (2003)
- Energy Charter Protocol on energy efficiency and related environmental aspects (1994)
- Energy Charter Treaty (ECT) (1994)
- Convention on Nuclear Safety (1994)
- United Nations Framework Convention on Climate Change (Kyoto Protocol) (1992)
- Convention on the physical protection of nuclear material (1980).

Generally, in Armenia there is a relatively low level of public awareness about importance of energy efficient renovations. This, together with the high strain of energy costs on household budgets result that the number of finished energy efficient projects is low. People undertake smaller, individual renovations, including energy efficient measures; these particularly focus on changing or repairing doors and windows, using energy efficient light bulbs and similar small scale steps; although these efforts mostly aim at improving the comfort level of inhabitants, and energy savings remain an auxiliary goal. Furthermore, many buildings first need some basic renovation (e.g. repair of the roof, repair of some engineering) before meaningful energy efficient measures can be effectuated.

Municipality engagement is vital for residential energy efficiency (REE) investment. Armenia's municipalities have been members of the Municipal Network for Energy Efficiency (MUNEE) since 2000, thanks to the funding of USAID and the work of the *Alliance to Save Energy* (ASE) in Armenia. One of the first steps under the MUNEE program in Armenia was the establishment of the Armenian Energy Efficiency Council (AEEC) in 2002. This Council, often referred to by local expert as "the Energy Club', includes ministry officials, non-governmental organizations, representatives of the academia, energy businesses and donors, aimed at developing a dialogue on national energy policy issues and identify priority areas for energy efficiency reform.

The Government of Armenia has established an instrument known as the Armenian Renewable Resources and Energy Efficiency Fund – R2E2. USAID and World Bank have both been active in Armenian energy sector, and contributed, among other documents, to the preparation of the "National Program on Energy Saving and Renewable Energy of Republic of Armenia' in 2007.

The country receives support from the Scaling Up Renewable Energy in Low-Income Countries Program (SREP), particularly through geothermal and utility-scale solar photovoltaic power generation. SREP was developed and is funded through World Bank, the European Bank for Reconstruction and Development (EBRD), and the Asian Development Bank (ADB) – although its activities are still in development, a set of barriers may hinder their smooth implementation, and for the time being they do not alleviate the country's dependence on non-renewable energy sources.

3.2 Bosnia & Herzegovina (BiH)

3.2.1 Background

Bosnia and Herzegovina is a landlocked, former Yugoslav republic in South East Europe, with a territory of 51,000 square kilometres, and a total population of nearly 3.8 million. It is bordered by Croatia to the north and west; Serbia to the East and Montenergo to the south; also the country has a very short Adriatic coastline around the city of Neum. Sarajevo is the country's capital and largest city with a population of almost 440,000 people, followed by Banja Luka (200,000), Tuzla (121,000), Zenica (115,300), Bijeljina (114,700), Mostar (113,000), and the country has 9 further cities with populations between 50,000 and 100,000.

The current territorial and political setup of the state is defined by the Dayton Peace Accords signed in December 1995, ending the 3.5-year long Bosnian war, one of the Yugoslav wars. Geographically, the state is divided into two Entities: the Federation of Bosnia and Herzegovina (FBiH) and Republika Srpska (RS). In addition to that Brcko district also belongs to the country. FBiH is further divided to ten Cantons. There are 79 municipalities in FBiH and 62 in RS. According to the preliminary results of the 2013 Census, the enumerated population was 3,791,622 persons, of which 2,371,603 (62,5%) lived in FNiH, 1,326,991 (35%) lived in RS, and 93,028 people (2,5%) lived in Brcko District.

Figure 2. BiH entities, Brčko District and the Cantons in FBiH

Source: Guardian Graphic

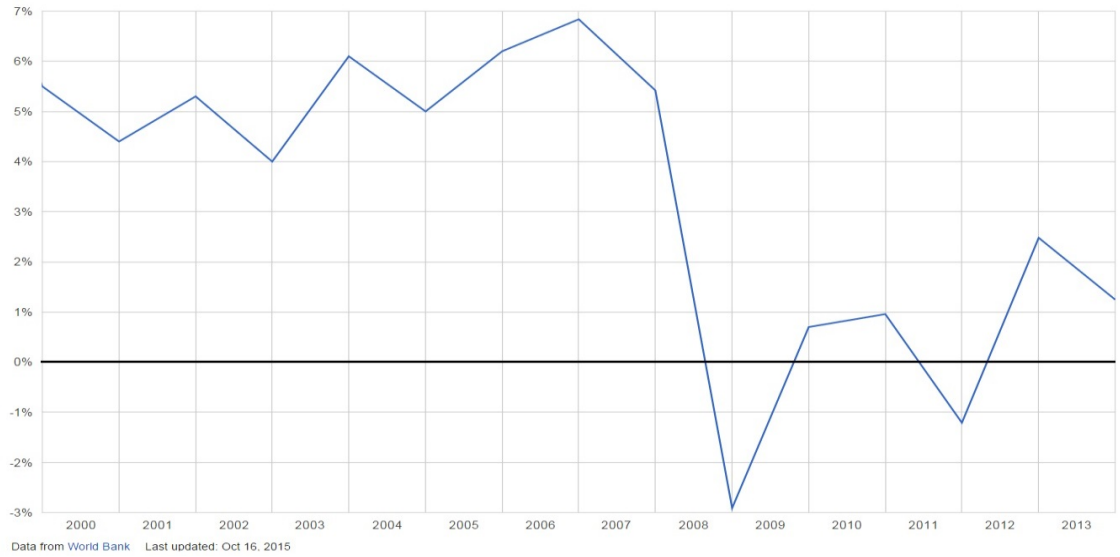
As the Rapid Assessment Report elaborated in the REELIH project describes, *"[t]he FBiH has its own constitution, a bicameral parliament and a government headed by a Prime Minister, who is nominated by the Parliament. The significant centers of political power in the Federation are the ten Cantons, which have their own parliaments and governments. […] The RS has a parliamentary system (a president and a prime minister) and a national assembly. […] The Brcko district covers the territory of the municipality of Brcko'* and is *"governed on an equal level with the two entities Federation of Bosnia and Herzegovina and Republika Srpska. The Brcko district is a single administrative unit of local self-government existing under the sovereignty of Bosnia and Herzegovina. It, therefore, has its own laws and regulations.'* This means that a total of 13 parliamentary systems and sets of ministries operate in the 10 Cantons, in RS, the Brcko, and on the national level. The extremely complicated public administration system also includes a directly elected tripartite presidency, and is a major hindrance to economic growth, while still considered necessary to maintain peace.

Based on the 2013 Census (the first Census since 1991) 48.4% of the population identified as Bosniak, 32.7% as Serbs, 14.6% Croats, and 4.3% as "other' – among other reasons (e.g. being children from mixed marriages) also to protest the country's ethnic quota system. There is also a strong geographic and religious division among the different ethnic groups. The predominant majority of Serbs live in RS, Bosniaks and Croats in FBiH (although they too live in separate territories), and few localities have remained truly multicultural. Also, Bosniaks are Muslim, Croats are Catholic, and Serbs are Orthodox Christians in general.

The Dayton Peace Accord therefore preserved the country's historical borders, but created a multi-ethnic state in which multicultural coexistence has not yet truly come to fruition. At the same time, the highly decentralized government hampers policy coordination and reform, while heavy bureaucracy and the segmented markets do not encourage economic development and investment. Official unemployment rate was around 44% in 2013 and 2014 according to the CIA World Factbook, which is one of the highest rates among former Yugoslav countries. The economy relies heavily on exports of

metals, energy, textile and furniture, but also on diaspora remittances and foreign aid. According to Eurostat data, Bosnia and Herzegovina's PPS GDP per capita stood at 29 per cent of the EU average in 2014. Economic growth was extraordinary in the post-war period (54.2% in 1996), then gradually dropped to a lower rate, but remained stably above 4% until the crisis in 2008; its economy has been barely stagnating ever since.

Figure 3. GDP Growth (annual change, %) in BiH, 2000-2014



Source: World Bank online database

The post-crisis recession triggered anti-corruptions demonstrations, which began in February 2014 in the northern Bosnian town Tuzla, and soon spread to other cities, including Sarajevo, Zenica and Mostar, with social and economic goals, and a strong anti-corruption and anti-nepotism sentiment. However, the demonstrations “ran out of steam’ in about two months; due to diminishing participation they ended by late April 2014.[4] Unrest therefore did not end in a “Balkans spring’ in 2014; however, this also put into question the country’s approach to extreme caution in possibly painful reforms.

3.2.2 Housing structure

Available statistical information on housing in BiH is extremely limited. The most recent Census took place in 2013, twenty-two years after the last one in 1991, as the Census was delayed again and again due to potential ethnic and religious tensions. As another externality of this potential tension there was no capacity (or interest) in assessing Census data in detail, let alone translating outcomes in English, apart from the ethnic and religious setup of the people of BiH, which was published and analysed in great detail. Accordingly this piece has to rely greatly on the estimations gathered for the Rapid Assessment Reports, and to the (again limited) available information from the preliminary Census results.

[4] See Wikipedia article on “2014 unrest in Bosnia and Herzegovina’, https://en.wikipedia.org/wiki/2014_unrest_in_Bosnia_and_Herzegovina

According to the preliminary results of the 2013 Census the total number of enumerated households is 1,163,387; and the average household accommodates 3.26 members. The number of households was 721,199 in FBiH, 414,847 in RS, and 27,341 in Brcko District. The total number of dwellings was 1,617,308, out of which: 991,384 (61,3%) in FBiH; 588,241 (36.4%) in RS, and 37,683 (2.3%) in Brcko District.

Table 2. Population, households, and dwellings in BiH (2013)

Area	Number of persons	%	Number of households	%	Number of dwellings	%	Avg. size of households
BiH	*3,791,622*	*100.0*	*1,163,387*	*100.0*	*1,617,308*	*100.0*	*3.26*
FBiH	2,371,603	62.5	721,199	62.0	991,384	61.3	3.29
RS	1,326,991	35.0	414,847	35.6	588,241	36.4	3.2
Brcko Dist.	93,028	2.5	27,341	2.4	37,683	2.3	3.4

Source: ASBiH preliminary Census results, 2013

These data suggest a massive number of vacant dwellings (28% of the stock), which may be a long term consequence of the war, more precisely the consequence of households fleeing from their homes. At the same time, the Rapid Assessment Report based estimations of roughly 1.05 million inhabited dwellings; and since more complementary data is available its estimations, this number will be used for describing the estimated housing stock and its energy characteristics.

According to the *BiH Household Budget Survey (2007)*, there are a total of 1,055,000 inhabited dwelling units in BiH. The country's multi-unit housing stock included 206,000 housing units in 7,000 multi-unit buildings (an average of 30 apartments per building, although in reality this could vary from 2 to more than 100). Most of these buildings were built before the 1990s. In a 20th century comparison, new construction has been relatively modest in most European countries from 2000, and in BiH it was further discouraged by Yugoslav wars, and construction capacity was largely absorbed by post-war reconstruction. Apartment blocks built before 1990 generally have little to no thermal insulation at all; and available information suggests that no drastic changes in the building stock took place in recent years.

Apartment buildings are concentrated on the urban areas; e.g. in Sarajevo 56% of the housing stock is located in multi-unit buildings. In the seven largest urban areas (Sarajevo, Banja Luka, Tuzla, Zenica, Biijeljina, Mostar, and Prijedor), they account for over 50% of the housing stock.

Table 3 - Main Dwelling Unit Construction by Type and Geographical Area (In thousands and percentage composition)

Geographical area	Construction type				
	Multifamily residential building	Detached house	Part of house	Other	Total (=100%)
Federation of BiH	22.4	66.0	9.7	2.0	658
Republika Srpska	15.2	79.1	3.6	2.0	375
Brcko District of BiH	(8.8)	86.7	:	:	22
Bosnia and Herzegovina	**19.6**	**71.1**	**7.4**	**2.0**	**1,055**
Geographical area	**Multifamily residential building**	**Detached house**	**Part of house**	**Other**	**Total**
Federation of BiH	71.4	57.9	81.5	62.3	62.4
Republika Srpska	27.7	39.5	17.5	36.8	35.5
Brcko District of BiH	(0.9)	2.5	:	:	2.1
Bosnia and Herzegovina (=100%)	**206**	**750**	**78**	**21**	**1,055**

Source: BiH Household Budget Survey (2007)

The privatization law in Bosnia and Herzegovina, after the dissolution of the Yugoslav Republics, provided that housing units were to be sold to the sitting tenants in almost all cases, usually at steep discounts from what was calculated to be market value. Almost uniformly across the Balkans region, apartment buildings were privatized by transferring ownership of individual apartments together with an ownership interest in the common property (the roof, stairways, foundation, mechanical systems and so on). This legal form of ownership is generally known as “condominium’ and has been widely adopted in Bosnia and Herzegovina (Habitat 2013). In some cases privatized dwellings were not only sold at discount prices, but were literally given away to disadvantaged groups (e.g. veterans).

It must be noted though that the majority of the privatized housing wealth was in a very poor initial condition, and together with the ownership, post-war reconstruction was left entirely to the new owners. In the aftermath of privatization in Bosnia and Herzegovina, the new owners were required by law to assume management responsibility for their buildings, but very rarely had the financial, legal or technical skills to fulfil their obligations. To this day the condominium regulations do not clearly delineate the tasks and obligations of HOAs, which is a massive hindrance in undertaking coordinated action, even when it comes to simple inevitable structural renovation. At the same time, condominium members on Habitat’s HOA survey (2013) indicated serious structural problems with the multi-unit building, or mentioned problems with the roofs, envelope, insulation, energy efficiency and energy costs – problems they have very limited means to address.

3.2.3 Energy provision systems and the financial framework

Indigenous resources play a key role in ensuring energy production in BiH (while contributing another factor counteracting the spread of demand for energy efficiency). The predominant sources of energy for heating are indigenously produced coal, lignite and renewable sources including hydropower and biomass (mostly wood). The remainder of the total energy use is provided from natural gas, fully imported from the Russian Federation (about 2,5% of total consumption).

While single family homes are often heated with a combination of biomass (wood), oil, coal and electricity, district heating and electricity are the most common heating methods in large apartment buildings in the urban areas. District heating is ensured from natural gas in Sarajevo Canton, but from crude oil or coal in the rest of the country.

Out of the major urban areas, 22 towns have district heating; according to 2007 data approximately 100,450 units have district heating in cca 3,300 buildings. Non-payment is a serious problem in dwellings with district heating. Payment rates are at around 40-65%, and households are not incentivized to pay regularly as they cannot be individually disconnected from the service. Service providers can, of course, initiate court procedure against households with arrears, but results take years to achieve, and service providers still face massive continuous losses in the meantime. At the same time, payment levels are near 100% for electricity and natural gas, as individual households can be disconnected easily from the grid, which gives the impression that the huge level of non-payment does not exclusively have to do with an absolute inability to pay, but still shows a high presence of low income households, who prioritize payments according to urgency.

Residential energy prices have been kept artificially low for socio-political reasons, as living standards are rather low in a European comparison as it is, and policy makers were wary of a potential backlash or even a violent uprising if residential discontent should rise too high. Gradual raises did take place and prices do follow world market levels, but currently household energy is still sold marginally below market price to residential users (except for natural gas, however this is used quite rarely for heating homes).

A number of donors provide credit lines for refurbishment, including EBRD, IFC, EIB and KWF; and a number of commercial banks (e.g. Raiffeisen, Sparkasse and UniCredit) offer individual residential energy efficiency loans using the credit lines offered by international donor organizations. It is important to note, nonetheless, that in a European comparison, relatively few financing opportunities are available specifically for residential energy efficient renovations. The microfinance sector is strong, and there are a number of microfinance institutions active in energy efficient renovations; however, they lend exclusively to individual households. A good number of lending and micro-finance instruments are available for single-family housing units, but none exist in practice for providing joint loans for Home Owners' Associations.

There are not strong enough economic incentives in place for end-users to improve energy efficiency:

- energy prices are kept artificially low, and social unrest is seen as politically risky. (note: there was plenty of unrest in 2014 without much consequence);
- lack of metering in case of district heating, not only for apartments but also on the apartment block level
- illegal logging leads to cheap firewood, so biomass heating is comparable in price to electric heating;
- energy poverty is widespread in BiH; an estimated 16% of households would not be able to adequately heat their homes if payment was properly reinforced. Some households already choose to disconnect their home from heating systems and heat just one room in the winter

Altogether, there is very little public awareness about the potential benefits of energy efficient intervention. Many home owners do renovate their housing and change doors and windows, but they do so to improve the quality of the housing and to obtain a higher level of comfort; energy efficiency (or even energy savings) rarely figure among the top reasons for renovating.

According to the Rapid Assessment Report (p 16), *"UNDP stressed that in order to be able to implement energy efficiency measures, households must be able to regulate their intake of energy and they must pay their actual consumption.'* At the same time, due to the prolonged post-crisis recession means for renovation and refurbishment are limited, which curbs interest in spreading energy efficient measures.

The minutes of a REELIH data analysis meeting confirm that as of 2014, *"there is no system subvention of EE measures on any government level in Bosnia and Herzegovina'*. At this point, REELIH project has been implemented in 4 municipalities, where municipalities accepted limited participation, due to their limited resources. The lack of adequate resources from the side of the residents was also the primary reason behind abandoning REELIH project on behalf of HOAs; on the level of home owners this could mean job insecurity or non-creditworthiness, but also in some cases incompatible attitude or expectations of further foreign humanitarian aid (and hence an unwillingness to commit own resources). This attitude may hopefully change as a result of the activities of ENOVA (the implementer of eth REELIH project in BiH) who elaborated an Action Plan for the energy efficient retrofitting of the residential buildings in Tuzla Canton which was officially accepted by the Canton and consequently opened up a way to implement renovation interventions more intensively than even before.

4 NATIONAL POLICIES FOR ENCOURAGING ENERGY EFFICIENT RENOVATION OF THE MULTI-FAMILY RESIDENTIAL STOCK IN CENTRAL AND EASTERN EUROPE: A REFERENCE FRAMEWORK[5]

4.1 State of the art

The aim of the case studies was to analyse the main national subsidy schemes for the energy efficient renovation of multi-family buildings in Central and Eastern Europe. The practice of four countries (Hungary, Poland, Romania and Slovakia) was examined to understand the policy solutions applied in the CEE region. A deep understanding of these practices can bring in new impetus for Armenia and for Bosnia & Herzegovina in promoting energy efficient interventions.

4.1.1 Background information on the countries

All four countries whose subsidy schemes were examined are former socialist countries that began their transition towards multiparty democracy and market economy in 1989-1990. In the 1990s they went through a fundamental economic and social transition, resulting in new market based institutional systems. These new institutional systems created the framework for an economic growth after the transition of the 1990s. This growth has continued till the financial crisis of 2008-2009, which – with the exception of Poland – had a negative impact on the economy, including the level of public expenditures. This was the time when most of the state subsidy schemes were either decreased or suspended. However, economic growth in these countries started to show an increasing tendency in the past few years.

Table 4. Basic economic and demographic data (2014)

	Hungary	Poland	Romania	Slovakia
Population size (million people)	9.87	38.018	19.947	5.443
Nominal GDP per capita (EUR)	10 500	10 700	7 500	13 900
GDP per capita (PPS) in % of EU28	68	68	55	77
Minimal net wage – monthly (in EUR)	342	404	190	352
Average net wage – monthly (in EUR)	509	634	345	664
Unemployment rate %	7,2	9	6,9	12,3

Source: Eurostat

Hungary is a medium-sized country in the Central and East European (CEE) region, with a constantly decreasing and aging population of roughly 10 million people, and an area of 93,000 square kilometres. Hungary went through a transitional recession characterised by massive privatization from the early to mid-1990s, with a drop in overall income levels and quality of life, slipping GDP, double digit inflation and the first appearance of massive social inequalities. In the late 1990s slight economic development could have been observed, and by around 2001 the GDP surpassed its pre-transition

[5] This chapter is based on a study of the detailed analysis of the subsidy schemes in some CEE countries prepared by MRI for Habitat for Humanity International in June 2015

level and accelerated economic growth was further stimulated by Hungary's accession to the EU in 2004. These tendencies were stabilized and speeded up until the Great Financial Crisis (GFC) of 2007-2008, which was followed by a prolonged recession well into the early 2010s. By 2015 the economy seems to have mostly recovered with more than 3% GDP growth rate in current years. However the demographic characteristics of the country have worsened dramatically. Aging is a crucial issue tied with a very low birth rate and heavy outmigration from the country to EU member states.

Poland is the largest among the CEE countries (with 38 million inhabitants) that joined the EU in 2004. Polish economy has been growing constantly, surviving without any major setback the economic and financial crisis starting from 2008. For the last five years the per capita GDP has been increasing – and converging to the EU average - with a stable 3-5% growth. The economic growth has been accompanied by relatively high unemployment rates that seem to have started to decline in 2014. The living condition of Poles has been increasing constantly over the last years. The economic growth occurred parallel to a very active outmigration to the EU countries that is not reflected in the population statistics. The demographic data suggest a slightly receding and aging population, with stable household structure and a very low fertility rate around 1,3.

Romania is the second largest country in Central and Eastern Europe (after Poland) with around 20 million inhabitants. The GDP per capita in Romania is the second lowest (after Bulgaria) in the European Union. However, the GDP growth rate in 2013-2015 was between 3.5%-4.2%, so there is a relatively fast convergence process going on partly due to growing absorption of the EU funds. Romania also suffers from negative values of natural demographic increase, largely due to strong external migration.

Slovakia, with 5,5 million inhabitants is located in Central Europe next to the Czech Republic, Hungary and Ukraine. Transition affected all spheres of life including new market actors (private companies), public administration (establishment of a new municipal system), privatisation of companies and the housing stock. Slovakia entered the European Union in 2004. The accession resulted in the harmonisation of the legal system and led to the inflow of relevant amount of financial resources as part of the EU Cohesion policy. Slovakia has introduced Euro as a currency in January 2009. In recent years Slovakia has produced a quite significant growth rate concerning GDP/capita. The population of the country is stagnating, with an insignificant immigration surplus. Its age structure is more favourable than the EU average with relevant share of youngsters providing long term demand for housing.

4.1.2 Housing stock characteristics

The general transition period of the 1990s resulted in transition of the housing sector as well. The privatisation of the formerly state/municipally owned multi-family stock led to an extremely high share of owner occupied dwellings, which also meant that the responsibility for the renovation and maintenance was assigned to the (new) owners. It took nearly a decade for many of them to get used to their ownership rights and responsibilities.

Table 5: Basic housing indicators

	Hungary	Poland	Romania	Slovakia
Share of multifamily housing	38%	46%	43%	52%
Share of owner occupied housing	91.6%	82.4%	95%	90.5%

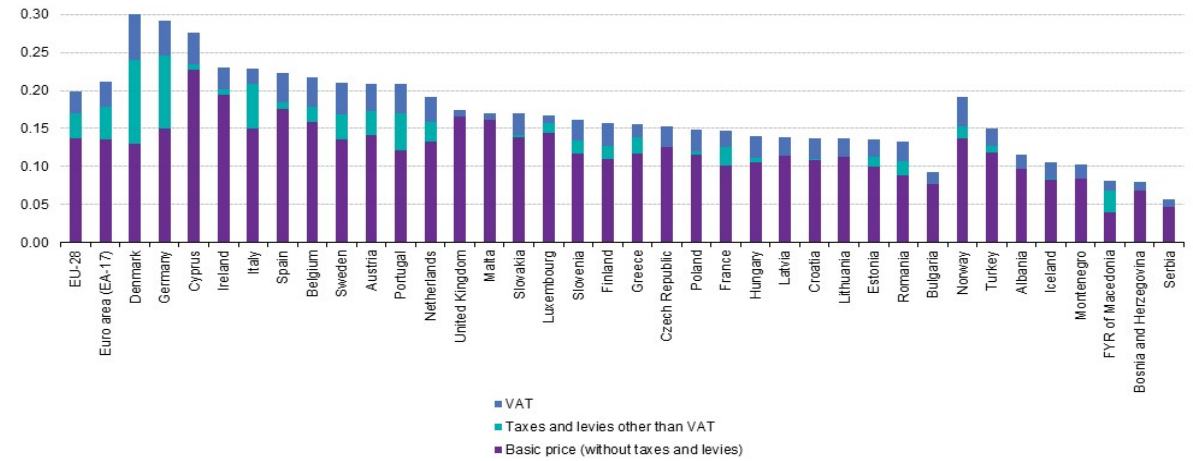
Source: Gerőházi, Éva and Szemző, Hanna (2015)

The share of multi-family dwellings is not extremely high in Central European countries (it is in fact similar to Western European rates). It is also not extraordinary that the share of multi-unit buildings in urban areas reach up to 70-80 percent of the housing stock. What is specific to these post-socialist countries, however, is the extremely high rate of owner occupied dwellings, the high share of multi-unit buildings built with industrialized or 'pre-fabricated' technologies, and the high share of buildings located in housing estates.

Energy parameters of the building did not seem to be relevant in the socialist era when electricity, gas and district heating prices were heavily subsidized. Energy became a crucial issue after the transition, when energy prices were partly or fully liberalised and increased significantly

Currently the price of energy for household consumption is practically liberalised and on par with world market price in Hungary, Poland and Slovakia, while still subsidized to some extent in Romania. A wider European comparison shows that household energy prices in CEE countries are similar to each other, and are significantly higher than in Bosnia and Herzegovina. (On the other hand energy prices compared to the average income of families result in a lot worse financial situation than in the Western part of Europe.)

Figure 4: Electricity price comparison for households across Europe-2013

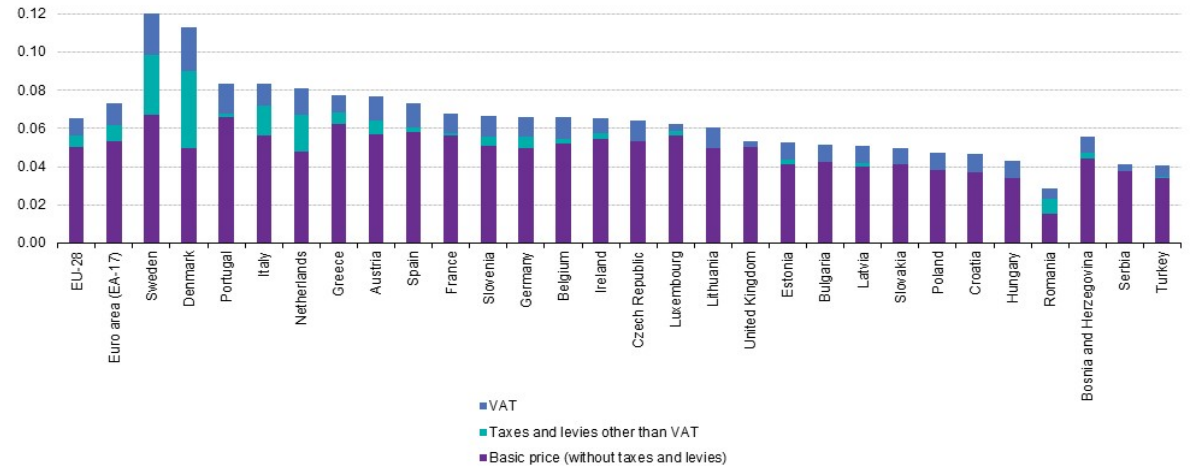


(1) Annual consumption: 2 500 kWh < consumption < 5 000 kWh.
(2) Provisional.
Source: Eurostat (online data code: nrg_pc_204)

Source:Eurostat http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Electricity_prices_for_household_consumers,_first_half_2013_(1)_(EUR_per_kWh)_YB14.png

However, looking at gas prices we might find that the price level in Bosnia is quite similar to that of CEE countries (which are among the lowest in Europe).

Figure 5: Gas price comparison for households across Europe-2013



Source:Eurostat http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Natural_gas_prices_for_household_consumers,_first_half_2013_(1)_(EUR_per_kWh)_YB14.png

Heating costs are more significantly influenced by gas prices than by electricity prices in these countries, as gas is a more significant source of direct heating as well as district heating. In the experience of CEE countries, the significant increase in gas prices over the 1990s provided a major incentive to home owners to implement energy efficient interventions in the building stock.

In addition, the relatively high share of multi-family dwellings with district heating must also be taken into account. The share of district heated units is the highest in Poland (76% of multi-unit buildings), while it is also significantly high in the lower end, in case of Hungary (covering 44% of the multi-unit stock). The vast majority of buildings with district heating is metered individually, or became metered as a result of subsidized interventions, which is also a major incentive when interventions resulting financial savings are taken into account.

4.2 Description of the national subsidy schemes

4.2.1 Hungary

Energy efficient renovation of multi-unit buildings was not a central objective of HOAs in the first decade after transition in Hungary, mainly because the most urgent interventions had to address the structural problems of the housing stock. In addition, the awareness of the benefits of EE interventions was quite low that time, and the newly established HOAs had just limited solvency and organisational capacity in the first few years.

Until around 2000 there were no grants for energy efficiency improvements, so only the HOAs with the highest average income and most well-informed management implemented small scale measures in this sphere. With later developments, external funding for renovations and a demand for EE interventions gradually reached a wider HOA market. These developments included not only the

increased subsidy amounts and wider involvement of public actors (municipalities, the state and later the EU), but also some more flexible loan products of the bank sector.

The most important subsidy types (from 1988 to 2015) are presented in Table 6.

Table 6. National and local subsidy schemes for multi-unit renovations and EE interventions[6]

Subsidy Schemes	1991			1994		1996					2001		2003				2007						2013		
1. State subsidized loans (since 1988)																									
2. Municipal subsidies																									
3. Contract Savings Scheme (Bausparkasse)																									
4. PHARE and ROPs																									
5/1. Panel Program																									
5/2. Green Investment Scheme (GIS)																									
5/3. Green Econ. Financing Scheme (GEFS)																									
6. Private/Civil Initiatives																									

A wide range of renovation subsidy programs were initiated between 1988 and today. Some of the schemes, particularly the earlier ones, did not focus on energy efficiency; they merely provided help for implementing much needed structural and technical renovations. Nevertheless, the experience of these was utilized at the formation of energy efficient renovation subsidy schemes; and in some cases, the overall logic of intervention was adopted into the EE schemes.

Concerning the evolution of the subsidy scheme in Hungary we can define 5 major periods in it:

1. Period 1 (1990-2000): 1990s were the years of establishment of new condominiums as a result of the privatisation process. This is the time when not only the HOA sector is taking shape but all the complementary services like professional property management, diverse financial sector and market based construction sector are created. This decade (especially the second part of it) is characterised by small scale financial support from the local municipalities to eliminate the most severe technical problems of the buildings, and in some cities where prefabricated buildings are essential part of the housing stock some EE measures were also taken. There was – and still is - a subsidized loan product available for the renovation of multi-unit buildings (up to 10 years duration) and also Contract Savings Banks offered savings+loan products from the middle of the 90s, however, the financial market was not developed enough to work out feasible products for HOAs from these sources.
2. Period 2 (2001-2005): In 2001 the first state program on supporting energy efficiency interventions in prefabricated multi-unit buildings was introduced providing 1/3 of the investment costs as a state subsidy and also obliging the local municipalities to provide the additional 1/3 of the costs. (Without the municipal subsidy the HOAs could not get state support). In the 2000s prefabricated buildings were in the centre of attention, traditionally build multi-unit buildings or family houses got little assistance. In the first part of the 2000s the

[6] Please note that the timeline shows the date of approval of the respective program's legislation. For types 1-5.1 and 6, the actual programs were usually launched in the same year the law was passed. GIS and GEFS were both launched two years after their legislation passed.

subsidy scheme operated at a relatively low intensity: small state amount dedicated to this purpose and small demand for the subsidy was present.

3. Period 3 (2005-2009): This was the 'golden age' of the panel programs. The program became politically important for the local authorities that put a lot of effort and funds to initiate EE rehabilitations. The buildings themselves also became more interested seeing the already completed examples in their neighbourhood and new financial products were developed that enabled the HOAs to take loans without complicated collateral requirements. The state also increased the annual amount dedicated for this purpose from the former € 3-6 million/year to € 30-50 million/year.
4. Period 4 (2009-2014): Due to the Financial Crisis the state was not able to provide the subsidy for the winning applications of 2009 rather it payed this amount (appr. € 150 million) during the years 2010-2013 causing financial uncertainties among HOAs and construction companies. However, even with these difficulties the call of 2009 was far the largest compared to the previous ones which call also allowed the HOAs to submit their proposals independently from the municipalities (meaning less overall subsidy the HOAs could get without the municipalities but HOAs were able to submit proposals without the contribution of the municipality, thus they could act without municipal permission). During this period EU Structural Funds also started to co-finance area based rehabilitations, in which housing interventions were implemented in areas threatened by social deterioration. However, the number of units renovated by these financial means is much less than those renovated by state funds.
5. Period 5 (2014-) In the current period a new call was issued February 2015) for the energy efficient renovation of multi-unit buildings between 5-60 units. The technical requirements and the quality control are a lot higher than in the previous calls, and the state itself provides a subsidy up to 50% of the interventions costs (the subsidy intensity is based on the technical content of the given project). . The future of the subsidy scheme is uncertain from 2016. Previously it was planned to be financed from EU Structural Funds but according to the latest announcement of the Hungarian Government multi-unit buildings would be eligible to obtain interest free loans from EU resources while the grant will be dedicated to state and municipally owned public buildings.

Main characteristics of the 'Panel Programs'

The schemes that entered into the public discourse as 'Panel Programs' are in fact a combination of nominally distinct programs, regulated by different legislative acts and funded from (partially) different sources. However, they are a logical continuation of one another, the calls, schemes, requirements, conditions, and other parameters overlap to a great extent so it is worth to be discussed together. These programs are the following:

- Panel Program (2001-2004)
- Panel Plus (2005-2007)
- Green Investment Scheme (2008-2014)
- Green Economy Financing Scheme (since 2014).

The so-called **'Panel Program'** launched in 2001 was the first large scale – national – centrally funded effort to boost EE housing renovation. Subsidies under this program were non-refundable grants channelled specifically into the energy efficient renovation of residential buildings constructed with industrial technologies. It provided state subsidy for the 1/3 of the investment cost and obliged the municipalities to pay additional 1/3 thus the HOAs had to pay the remaining 1/3. On the other hand, the program had no social targeting at all. The amount provided by the state could not exceed 400.000 HUF/unit (approximately € 1 600 at the HUF/EUR rate of that time). In the early years, interventions

were modest, both in terms of subsidies and of the subsidy per apartment. However, the program proved to be viable, and it started to be more and more "popular' as the mortgage market expanded and HOAs became used to the program and its requirements.

In 2005 the newly initiated **'Panel Plus' Program** (officially named 'Panel Plus Loan Program for a Successful Hungary') aimed at broadening the spectrum of the original Panel Program by introducing a Panel Plus Loan. That was a loan with preferential interest rate provided to HOAs but also to municipalities to co-finance the grants from the panel program. Unfortunately, this new element did not have any effect on the EE market as the conditions of this loan were not at all more preferential than that of the subsidized loans (existing from 1988 for the renovation of multi-unit buildings) combined with contract savings that were very commonly used by that time. This was the time however, when the previously limited EE 'panel' renovations matured and began to proliferate. The success of previous renovations gave municipalities political motivation to create their own grants providing co-financing. Also, commercial banks began to catch up with state subsidy opportunities, and started to offer products - with a collateral of the cash-flow of the condominiums - that would co-finance HOA renovations with a combination of state subsidized renovation loans and Contract Savings Schemes, resulting in a nearly zero interest renovation loan for HOAs. The eligible beneficiaries of Panel I and Panel II were (1) condominiums, (2) housing cooperatives and (3) municipalities as long as they use the grant for the EE renovation of a full multi-unit social building (or a building part fully separated from neighbouring buildings by dilations) built with industrialized technologies, in a way that its carbon dioxide emission is reduced after the renovation.

The last 'panel program' was the **'Green Investment Scheme' (GIS)**, running between 2008 and 2014, launched after the ratification of Act LX of 2007, or 'Climate Change Act'. The extent of reduction in CO_2 emission had to be in accordance with Ministerial Decree (MD) 7/2006.[7] The call of 2009 differed from the previous ones concerning its financial possibilities: the maximum contribution of the state was increased from 400.000 HUF to 500.000 HUF, € 2,000 from 2008 in exchange rate of 2008 and there was a climate-bonus offered in addition to that: if the building reaches the energy label of at least C than additional subsidy can be gained based on the level of renovation (higher energy label results in higher bonus from 10% up to additional 27%).

GIS calls (except for 2008 and 2009) were smaller both in scope and allocated budget. Instead of an annually repeating pattern (as in offering 1/3 payment of EE renovation of one specific building type), they became very specific, but also very diverse. The first call aiming at a different housing type was 'GIS Climate Friendly Home Energy Efficiency Sub-Program', in support of EE renovation of housing built with traditional technologies. Unlike programs targeted at pre-fabs, measurable reduction of energy use was already a criterion. However, later on GIS sub-programs became shorter in call deadlines, smaller in available budget; and as specific as 'EE Household Appliance Replacement', 'EE Light Bulb Replacement', or 'changing external doors and windows in traditionally built multi-unit housing with 1-4 housing units'.

GIS programs were replaced by **'Green Economy Financing Scheme' (GEFS)** from 2014, legally established in 2013 (National Development Ministry Ordinance 69/2013). The first call under GEFS was launched in February 2015, aiming HOAs in buildings constructed between 1946 and 2006 and with at least 5 but not more than 60 apartments.

The first calls under GEFS were opened in February 2015. The full subsidy amount was HUF 10 billion (cca EUR 32.7 million on average 2015 exchange rate), comparable to the former Panel

[7] 7/2006 (V. 24) Decree of Minister without Portfolio About Determination of Energy Efficiency of Buildings.

Program funds, and the intensity of subsidy increased to 50% - however not exceeding 750-950 HUF/CO_2 unit gained. The national fund was allocated to the 7 statistical regions of Hungary based on the number of multiunit buildings, aiming to strengthen geographical balance. This call had an extremely short deadline: the call was announced at the end of February, and the first submission date was 30 of April 2015. The call also had some relatively high technical and administrative requirements compared to the previous calls. The role of municipalities is limited in this subsidy scheme as the HOAs submit their application electronically to the Ministry of National Development, they contract out the technical auditing and construction works, they do themselves all the preparations (however the transaction costs can be reimbursed if the application is supported.

The latest call opened in February 2015 and no calls were announced since then. The financial source for the renovation of the multi-family buildings is still uncertain (as of September 2016). Even if nearly 300 million euro was dedicated for financing energy efficient interventions in residential buildings as a form of grant, the government decided to turn it into interest free loan and transfer the remaining funds for financing the renovation of public buildings. The modification of the Operational Program on Environment and Energy Efficiency was initiated because of that but still not accepted by the European Commission which is not favour for the idea of limiting the renovation potential of the residents.

Other important subsidy schemes

Although the Panel Programs are considered the most important elements of the energy efficiency housing support in Hungary, there are also some other important financial schemes that contributed to the overall results of the energy efficient interventions. These are the following:

State subsidized low interest loans and contract saving schemes

As we have already mentioned before, the state subsidized low interest loans had a crucial role in the renovation of multi-unit buildings (especially from around 2003).

The initial subsidy – between 1988 and 2000 – was 50 percent of the payable monthly instalment, but could not exceed the amount of payable interest. This was later modified to 70 percent of the interest for the first five years, and 35 percent in the next five years, and the funding would be phased out entirely after 10 years. In its earlier phase, a loan with a 2-7 percent interest rate was provided, in a financing environment where 27-29 percent interests were the norm on the open market. In spite of these favourable conditions there were very few contracts made. The reason was that at the time there were no proper financial products developed for home owners associations, individual loan contracts with individual liens were required instead. By the early to the mid-2000s the commercial financing environment developed dramatically, and as a consequence, lending institutions have come up with combined loan products that united the possibilities of subsidized loans with contract savings schemes, providing HOAs with a near-zero interest rate loan. In addition the collateral requirements were eased substantially: the major collateral is the renovation fund itself as a pledged income stream. Those HOAs that have significant arrears among their residents (exceeding 10-20% of their revenues) might not be eligible for renovation loans based on the banks own regulations. By these improvements of the financial tools the state subsidized interest became the major co-financing source of renovations besides grant schemes.

Interest rate subsidized loans are often combined with contract saving schemes to co-finance either the whole renovation and/or the own-share needed to co-finance grants provided by the national government and the municipality. The combination of contract savings schemes with interest rate

subsidized loans in practice means that the residents sign a contract with the savings bank in addition to the common contract of the HOA and assign the amount of savings to the HOA. They pay the monthly contribution to the contract savings throughout the common fee of the HOA for 5-10 years and in parallel the interest is paid for the commercial bank for the subsidized loan (joint payment for a joint loan). As the contract savings period terminates the whole accumulated capital is transferred from the contract savings bank to the commercial bank. By this mean the government subsidy for the interest rates and the contracts savings are utilised at the same time resulting in a nearly interest free loan.

EU Funding for urban regeneration

Before 2007 there was only one type of rehabilitation program financed from EU sources, a consequence of which was that the implemented regeneration projects were almost exclusively profitable city centre regenerations, while less financially attractive residential areas were almost entirely omitted. To counteract this effect, and to meet the requirements of the EU according to which housing interventions can only be implemented in areas being in or being endangered by social deterioration, the funding target area for 'social rehabilitation' was defined for the 2007-2013 budgeting period. The renovation of residential buildings was financed from ERDF and implemented through socially sensitive rehabilitation programs which also included (obligatory) interventions in public spaces, public buildings and also ESF type of measures to enable the local citizens. The maximum level of subsidy intensity in regeneration programs (which contains the EU funding, the 15 percent compulsory contribution of the state and 15 percent contribution from the local municipality) could reach 85 percent in case of housing interventions.

ERDF funding has been playing a relatively important role since the late 2000s in renovating multi-family buildings, but its effect cannot be compared to that of the state funded panel programs.

Results and impacts of the program

Cumulating the outputs of the different stages of the Panel Program, multi-unit buildings with approximately 350.000 dwellings gained subsidies in the last 15 years. However it has to be strongly emphasized, that there are serious overlaps in this number, because most of the buildings applied and gained subsidy for more than once, and consequently counted more than once in the statistics. There is no exact number on the amount of units that participated in the programs. (However this is a usual statistical problem in other Central and East European countries operating subsidy schemes.) The amount spent for the different types of the Panel programs is approximately € 300 million – till the end of 2011 and no major payment was implemented afterwards.

The direct EE impact of programs under the 'panel' brand is hard to measure because there was no subsequent monitoring of the EE interventions, there were only estimations. However according to the government's GIS website, the average energy savings achieved through GIS subsidized projects was around 40%, while the ambition was to raise this to 60% in the future.

Today we can say that relevant share of the multi-family (mainly prefabricated) housing stock was partially renewed by means of the subsidy scheme. The signs of renovations are visible all over the country and in spite of the difficulties, the program resulted in significant improvement of the housing stock.

4.2.2 Poland

Interventions to improve energy efficiency of the housing sector have been around for more than two decades in Poland, and by now have acquired a level of stability. They have been embedded into the larger framework of improving the energy efficiency of the economy and transportation, as well as generally the management and protection of the environment.

The consecutive legislations targeting energy efficient refurbishment and housing construction have evolved through time, typically reaching a wider population segment. The following table lists the most important programs with a focus on the housing sector and their effective time frame.

Table 7: National subsidy schemes for EE interventions

	1991				1995	1996			1999								2007								2015
Subsidy for the refurbishment of cooperatives																									
Polish Housing Kasse																									
Thermo-modernisation Program																									
Housing subsidy in the Regional Operational Programs																									
Program subsidizing the construction of energy efficient housing																									

Before the regime change, in the late 1980's the Council of Ministers, aware of the poor technical standard of multifamily cooperative housing (major investor in cities at that time), took the decision to subsidize the removal of technological shortcomings (including some toxic materials) and renew the system for the provision of energy (central heating and hot water) in a form of state credit, which could be entirely amortised. From January 1, 1990 along with the Balcerowicz shock therapy no longer such credits existed. So the government offered in years 1991 – 1997 subsidies for cooperatives for similar purposes. Money was allocated in yearly state budget law and procedural details were established in an ordinance issued by Minister in charge of housing. The maximum subsidy was 80% of costs of improvements. Generally all cooperatives in need, effectively managed, could solve these technical problems. The government stopped this program in 1997 stating that problem with shortcomings has been solved and promising to continue the support in the sphere of energy savings in a new law on supporting thermo-modernisation. This was the Thermo-modernization Fund, which started to operate in 1999.

Main characteristics of the Thermo-Modernisation Program

The 'Act on Support for Thermo-Modernisation Investment in Buildings' was passed in 1998, and defined the principles of support for thermo-modernisation investment projects, establishing at the same time a Thermo-Modernization Fund managed by the State Development Bank (BKG). The Polish National Energy Conservation Agency established the new scheme, which could be offered to all kind of building owners and was formulated based on available local and foreign technical experience.

Thermo-modernisation projects eligible for support include end-use improvements in residential and tertiary buildings, reduction of energy losses in heat distribution networks and the substitution of conventional energy sources by renewable energies. The possible recipients are manifold, including condominiums/housing associations, cooperatives, homeowners of single family buildings and municipalities. Besides, the scheme is available to local heating grid or local heating companies, but it excludes government budgetary units and institutions.

The established Thermo-Modernisation Fund provides a state budget financed bonus for the applicants for their energy efficiency refurbishment procedures. Originally the scale of the bonus was 25%, but since 2009, following the amendments of 2008, the bonus equals 20% of the loan provided by the bank, with the restriction that it cannot be more than 16% of the entire cost of the thermo-modernisation project and two-fold of the foreseen annual savings in energy costs, as specified in the energy audit.

The bonus is paid by the State Development Bank to the crediting investment commercial bank directly from the Fund (owned and managed by the State Development Bank, however it is not part of the Bank's balance sheet) as a repayment of the part of credit instalment just after the all the modernization works are completed. Thus, the projects are pre-financed by the different investors – HOAs, cooperatives, municipalities, etc. – and upon the receipt of the payment, the amount of their outstanding loan is diminished with the amount of the bonus. Usually, there is only a very short time span between the taking of the loan and the completion of the project.

The thermo-modernisation scheme is available to condominiums, housing co-operatives, commercial companies – e.g. in the heating sector -, municipalities and individual home-owners as well. However, the main beneficiaries of the Fund have been condominiums and cooperatives so far.

The energy savings demand forms a crucial part of application process for the thermo-modernisation premium. It varies between 10-25%, depending on the type of intervention the applicant plans to carry out. This has a very interesting result that certain buildings, where the owners have already done some interventions on their own, have difficulty or not able at all to meet the demanded saving levels.

In 1999, the first year of the program the basic regulatory framework was prepared. Since then only minor regulatory changes were necessary, mostly between the BGK and the commercial banks and the Ministry of Finance. Over the years, the Ministry of Finance has become more flexible, trying to respond quicker to the breaks in funding. Another change included the redefinition of technical parameters as a result of the technological improvements.

Low level of applications reflected the first years of hesitations, the fact that some rules were created while working and it took a great deal of time for making the budget planning. Between 1999 and 2002 only very few applications arrived. This is of course also in connection with the fact that it was still the time of a budgetary crisis and tough macroeconomic conditions, and loans for condominiums just started to become popular as a banking product.

Substantive amendments to the Thermo-Modernisation Act happened in 2008, following a set of modifications that influenced both the financial parameters and the scope of the program. As a result

the level of support decreased, however the scope of the scheme was also broadened. Although the main goals of the Fund have not changed, this modification meant that starting from 2009 the premium was cut back from 25 to 20% – which importantly did not result in fewer applications. Furthermore, the financial strictness was eased: prior to the changes the Standard Pay-Back Time (SPBT) had to be equal to (or less than) 10 years and the loan could not exceed 80% of the value of the project. Both of these regulations were loosened, opening up the possibility for more complex, bigger interventions.

The most important change in the 2008 amendments was the introduction of the renovation bonus and the compensation bonus. Both bonuses affect a significantly smaller share of buildings, and have a somewhat different focus: making the physical structure of the building more of a priority. The renovation bonus may be used by owners or managers of multifamily buildings, which buildings were constructed before 1961. It aims to help the renovation of the physical structure, propelled by the fear that many would be demolished as a result of serious neglect. Thus the bonus applies to repairs undertaken by individuals, condominiums, cooperatives and social housing societies. It only applies to the residential parts of the buildings, thus if 60% of renovated area consists of dwellings, 60% of the total costs may be subject of bonus. The renovation bonus requires a renovation audit (with some references to energy savings), but it is primarily focusing on renovation of multi-family housing, the replacement of windows or renovation of balconies in multi-family housing, even if these are used exclusively by dwelling owners and the reconstruction of multi-family housing buildings, which leads to their improvement. The maximum amount of the bonus is 20% of the loan, but not more than 15% of the entire project cost.

The compensation bonus focuses on an even smaller segment and addresses only natural persons – the owners of a building or their heirs of a residential building containing at least one flat that was under the municipality's disposal and rent control. The premium is a single, one-off payment assigned to help to cover the cost of renovation. It amounts to 20% of the costs.

The structure of the funding reflects that the thermo-modernisation bonus has remained the priority despite the changes, and the other two bonuses receive relatively little funding. In 2015, as of the end of March there were 162,7 million PLN (39,68 million EUR) left for the 2015 interventions for thermo-modernisation bonuses, whereas 41,7 million PLN (10 million EUR) for renovation bonuses and 8,7 million PLN (2,1 million EUR) for compensation bonuses. The Fund is financed solely by budgetary resources, although for a while it was considered to include ERDF and EU resources as well. As for the possible use of EU resources together with the thermo-modernisation bonuses for an intervention is still a debated issue. Currently it is not quite clear to what extent can the different components of the same renovation be financed by different subsidized sources. In practice the Bank for Environmental Protection uses this method.

In every case bonus is awarded automatically, on a first come first served basis to the eligible applicants, if the applicant fulfils all the requirements and there is enough money in the Fund. Although the Fund has existed for almost two decades now, the amount of money available fluctuated substantially, depending on the actual budgetary situation of the Polish government, causing ruptures in the service. Often, when banks realize the lack of available money, they stop taking new applications. The State Development Bank reports systematically the amount of accessible resources.

Subsidy provision process and the role of different actors

Application to the Thermo-Modernisation Fund is decided by the owners, and unlike in many other CEE countries it is not facilitated by the municipality. The municipality itself can apply as well, in case it wants to refurbish its own buildings, but has nothing to do with why and when the non-municipally owned multi-family buildings – making up by far the vast majority of applicants – turn to the Fund.

Housing managers and cooperative managers play a crucial role in organising applications to the Fund.

The Fund finances every application that arrives, if all the conditions are met and there is enough money for it. The premiums are awarded by the State Development Bank (BGK) from the Thermo Modernisation and Renovation Fund (formerly Thermo-modernisation Fund). The investor applies to be awarded a thermo-modernisation or renovation premium to BGK through the intermediary of the commercial bank.

Commercial banks have been interested in participating in the program since the early 2000s, however, with not the same enthusiasm. Banks usually prefer those buildings that also have their savings accounts in their branches. Commercial Banks are crucial actors in the process, partly as intermediaries between the buildings and the State Development Bank, and mainly as loan providers for the buildings in need of refurbishment. At the beginning there were some problems concerning the attitude of the banks. Many were weary of taking up large, multi-family buildings being afraid of the complications. However, cooperatives and condominiums turned out to be very good clients, and commercial banks are interested in providing services to them. They usually provide loans for 4-7% interest rates, and the collateral for the loan is provided by the saving fund of the building. Such a fund is compulsory by the law, and it serves as the primary source for financing refurbishments like the energy efficiency refurbishments. Typically, the amount paid for the renovation fund is doubled for the time of taking and paying off the loan. Buildings usually don't combine different subsidies to finance the investment, rather they take a relatively large loan – it can get as high as 80% of the intervention - and finance the rest from their refurbishment fund.

The standard procedure in Thermal Modernisation process comprises of the following steps in case of a multi-family building:

- Majority decision of the owners to participate in the renovation
- Elaboration of energy audit
- Designing,
- Construction permit,
- Loan application to a commercial bank that forwards the request to BKG
- Obtaining the loan letter and thermo-modernisation bonus,
- Performing,
- Upon the confirmation of the project by the commercial bank the bonus is received and the monthly instalments reduce

Energy audit is required to prove technical and economic evaluation. As a consequence, the first step is the creation of an energy audit that could provide the basis for the possible savings. It is awarded only upon the successful provision of data that enough energy will be saved. The Act, through its ordinances describes precisely the standard of the energy audit and calculation methods. Audits are carried out by professionals, based on the basic provisions specified in the directive to the Thermo-Modernisation Act. The poor quality of energy audits is the number one reason, why a few applications are refused. In this case these audits can be corrected and the building can apply another time.

Other important subsidy schemes

Housing Kasse (Contract Saving Scheme)

It was established in 1996 and promoted until app. 2001. It was a contract saving scheme, a local implementation of the German Bausparkasse program. The idea was that a long term low interest

savings for housing purposes accompanied by the right for low interest mortgage after agreed time and volume of savings would accelerate housing investments including modernization and repairs.

Program subsidizing the construction of energy efficient housing

The BOS Bank (Bank for Protection of the Environment) cooperates with the NFEP&WM fund and they have agreed on a program of special subsidy for 'very energy saving new housing' with total budget of 300 million PLN (73,17 million EUR). Bank provides credits for construction/purchase of very low energy and/or limiting CO2 emission of houses or dwellings. The credit is accompanied by the bonus (premium) up to 50 000 PLN (12.2 million EUR) /house or 16 000 PLN (3.902 million EUR) /apartments financed from the NFEP&WM funds.[8]

Housing subsidy in the Regional Operational Program

Regional Operative Programs (ROP) have been factors in providing EU funding for energy efficient investments in Poland. Funds for energy efficiency were distributed through various operational programs, and on regional level through the 16 ROPs. All ROPs had the similar structure, but the financial resources were specified on a regional level. The Polish authorities adopted the principal of maximizing housing related funding within each ROP to 3%, however in practice usually the allocation was even lower than that. The regions were not required to use ERDF for housing initiatives, but 13 out of the 16 regions opted to do so. Funding was available for housing projects that were complementary to ROP projects regarding urban areas threatened by degradation and social exclusion.

Results and impacts of the program

The steady contribution of the Polish government to the Fund has created this programme the longest running one in the CEE regions. Despite this, little is known about its direct effects. There seems to be a general satisfaction with the program both among decision makers and recipients, although the upcoming general review of 2016 could show some problems. The application numbers reflects a steadily growing interest with smaller slumps, where the costs and the intensity have been controlled by the annual budgetary negotiations and allotments.

The fact that it is the longest running program, with the highest stability in the region, allowed the policy makers to slightly reduce the state subsidies, and expand the program in other directions. Because the application procedure is so that in case of meeting all requirements the premium becomes automatic, the number of applications and the number of awarded premiums is very close. This latter characteristic is an important cornerstone of the stability of the program.

Despite the relative success, little is known about the financial consequences of the interventions. Much effort is spent in the preparatory phases of the projects on an energy audit, however there is no compulsory check-up at a later stage. What can be assessed however is that the bonus helps to mobilize a vast amount of investment. It is estimated that between 1999 and 2010 over 0,3 billion EUR were provided for thermo-modernisation bonuses by the Polish government, instigating approximately 1.6 billion EUR investment into the housing sector.

The analysis of the program also showed that the program aims for the middle income groups: there is no social targeting, and through the insistence of taking loans the poorest are left out of the program.

[8] To learn more about the program there is a Polish website available: https://www.bosbank.pl/klienci-indywidualni/finansowanie-twoich-marzen/kredyty-dla-domu/kredyty/kredyt-dom-energooszczędny

Loans serve a double purpose in the program: on the one hand they allow buildings to participate with relatively little savings of their own, and a relatively low level of state support. On the other hand, through loans commercial banks get involved, becoming an effective administrator of the scheme and a reliable control for the state, making sure it only allocate resources for financially stable buildings.

The Polish case justifies that successful programs don't have to be very generous. The Thermo-Modernisation Fund has been designed to limit the budgetary pressure on the state resources (the premium has been limited and there were no other subsidy programs combined with it) and there was no "phasing-in period' of higher subsidies either. However, with enough time allotted and a reasonable economic and policy stability, people have become interested.

In spite of the relative success of the Thermo-modernisation Fund the financial sources of renovation widened substantially from 2016. EU funds tend to become more and more important: Regional Funds for Environmental Protection and Water Management, the Operational Programme Infrastructure and Environment and the Regional Operational Funds provide grants with 30-85% aid intensity for multi-unit buildings for different types of energy efficient interventions. The subsidy rate exceeds substantially that of the Thermo-modernisation Fund however the requirements will also increase and aim for deep renovation (e.g. more than 60% savings are required).

4.2.3 Romania

In Romania a thermal rehabilitation program for multi-family residential buildings built before 1985 was launched in 2002, coordinated by the Ministry of Regional Development and Tourism. Because of the unfavourable financial conditions (it required 1/3 own share from the residents) and excessive technical content (beside the insulation of the envelope, it required the rehabilitation of the internal heating system as well) this program had no real outputs as there was no demand for that.

The program was re-launched in 2006-2007, as part of the first National Energy Efficiency Action Plan (under the 2006/32/EC Directive). The aim of the new, modified program, called 'Heating 2006-2015' was to decrease heating energy consumption in renovated buildings from an actual estimated energy consumption of 180-240 kWh/m^2 to below 100 kWh/m^2. This Program had two elements: The National Program on Thermal Rehabilitation of block of flats (GEO 18/2009) and Program for improving district heating systems. The national sources behind the program were significantly decreased in 2011. This has two main reasons: first, the general budgetary restrictions due to economic crisis and second, the launching of the EU financed programs (targeting the country seats) which took part of the financial responsibility from the state budget.

It was already decided in December 2010 that funds will be allocated to the Regional Operational Program 2007-2013 of Romania for an "Energy Efficiency Scheme in Residential Buildings (EESRB)'. Currently the two programs (the state funded one and the EU financed one) run simultaneously, trying to avoid an overlapping in the subsidized buildings. So legally country seats are not excluded from the governmental program, in fact they are "redirected' into the EU financed program.

Table 8. National subsidy schemes for EE interventions in Romania

2002				2006			2009	2010	2011				2015
Programs for the thermal rehabilitation of multi-level residential buildings													
				Heating 2006-2015 – Warmth and Comfort, Program - Improving DH systems (2006-2015)									

				-The national Program of Thermal Rehabilitation (redesigned in 2009 by GEO no 18/2009 and decreased substantially in 2011)					
								Thermal rehabilitation of housing stock financed by bank loans with Government guarantee complementary to the Multiannual National Program for increasing the energy performance of dwellings (ongoing) – Complement to the national Thermal Rehabilitation Program	
								Casa Verde Program	
									Improving Energy Efficiency for low income households living in public housing and renovating community buildings (2011-2015)
									Energy Efficiency Scheme in Residential Buildings (EESRB)

Main characteristics of the domestic Thermal rehabilitation program of multi-level residential buildings

The measures could comprise thermal rehabilitation of the external walls, basement floors and roofs, the replacement of the existing windows and external doors with double-glazed ones, the thermal insulation of the basement pipes and painting of the exterior walls (for aesthetic reasons). The energy savings must have reached at least 30% as a result of the interventions. Initially the financing was divided between the national budget (34%), the local budget (33%) and the owner's contribution (33%). There was no significant demand for this programme thus it was not operating in practice.

In 2009 the program was significantly modified. It now aims to increase the energy efficiency in:

a.) blocks of flats built between 1950-1990
b.) individual housing units owned by natural persons
c.) social housing (block of flats and individual housing units) owned or managed by local councils.

The funds for this program may come from the state, local budgets and the owners' associations' funds in the following way:

a) 50% of allocations from the state (Ministry of Regional Development and Housing) budget, approved on annual basis;
b) 30% of the funds from the annual budget off the municipalities;
c) 20% of the fund from the owners' association and / or other legal sources.

Upon request, within the budget, the local public authorities may support the homeowners' associations by advancing the 10% of the value of the works. The amounts thus paid will then be recovered by the local public authorities by charging the thermal rehabilitation tax to the property owners for 10 (ten) years. The main steps of the program implementation are the following:

- identification and inventory of residential buildings (by local authorities)
- notifying owners' associations by local coordinators on the entry in the local program;
- the decision of the general meeting of the owners of enrolment in local program and signing the warrant;
- design intervention works by local authorities;
- submission of projects to the Ministry
- ministerial decision about the projects selected for financing
- procurement

- execution of the intervention;
- reception on completion and issue energy performance certificate, identifying specific annual energy consumption calculation for heating;
- final acceptance after expiry of the performance guarantee of 3 years.

Local public authorities are compelled to draft local programs concerning the increase in the energy performance of the housing stock. For the implementation of these local programs, local coordinators identify the blocks of flats eligible under this program, and inform the homeowners' associations which have to approve participating in the program with simple majority.

Finally, a mandate agreement is signed between the homeowners' association and the local coordinator, allowing the local coordinator to manage the rehabilitation works.

Local authorities are responsible for ensuring the technical expertise, energy audits and energy performance certificate of block of flats, intervention works, technical project preparation works and developing specifications for contract works. The decision about the technical content of the project is based on a feasibility study and a cost-benefit analysis. Some (or all) of these activities are purchased through public procurement process.

When developing the scheme, there was a discussion about who should be the applicants and the managers of the projects: Home Owners Associations and /or the individual owners or local authorities representing the association of owners? According to experts' opinion international experience in South and Eastern Europe shows that schemes that support directly home owners and their associations are suitable and effective for simple energy efficiency improvement (ex. replacement of energy inefficient windows) that are applied mainly in individual properties/apartments. However, larger scale investments implemented by HOAs have significant risks (the experts considered that associations of owners in these countries do not have the capacity to manage identification, development, financing and implementation of an integrated EE investment for the whole building, without adequate technical support, home owners rely too much on contractors; need of consultancy services makes the process very costly for HOAs, etc.)

Given the above risks, it was decided to develop a structure in Romania where local authorities play a central role. Local authorities had already played role in organizing and managing energy rehabilitation projects regarding the former thermo-modernisation program. They had the capacity and experience to organize and manage service contracts for project preparation and supervision of works, as well as to apply public procurement procedures for supplies and works. Another advantage of this arrangement is that it is easier to achieve economies of scale in administration and construction costs by grouping together several individual projects into sizable tenders.

Decisions at the Ministry are based on the municipal preferences and some territorial equalization principles. They are trying to allocate the scarce resources between the projects that are most highly ranked by the municipalities according to local preferences (e.g. district heated buildings, buildings in a certain neighbourhood or buildings with worse technical conditions). In addition the state tries to achieve some kind of equalization between regions by allocating equal funds to them.

In 2010, because of the difficulty of HOAs to co-finance their 20% share of costs of rehabilitation, the Ministry of Regional Development has pushed for the adaptation of Government Ordinance GO 69/2010 to provide government guarantees for bank loans. However this complement did not appear to be successful as banks in general did not issue joint loans (or only with individual liens as collateral) and the government guarantee did not help this situation thus bank loans are still not co-finance the rehabilitation projects.

One peculiarity of the Romanian subsidy scheme is that the local budget contribution (30% of the entire sum) is basically an earmarked grant coming from the central budget. In this case local governments have different incentives compared to local authorities in other countries that allocate their own resources to co-financing purposes (sources include levied local taxes or general purpose grants) and have to sacrifice their other goals. This characteristic of the program has two main consequences: First, the general economic power and financial situation of the local authorities have no effect on the project output (meaning that it's not true that the richer is the municipality, the more buildings can be rehabilitated). Second, municipalities have the incentives to generate as many rehabilitation and thus attract (and keep) as much money in the city as possible. As they do not have to make allocation decisions between different sectors (this grant can only be spent on this purpose), they do not have to consider the alternative use of these amounts, so they have very strong incentives to support the program.

Main characteristics of the EU financed rehabilitation program of multi-level residential buildings

In December 2010 it was decided to allocate funding within the Regional Operational Program 2007-2013 of Romania for an Energy Efficiency Scheme in Residential Buildings (EESRB). Decision makers and their advisory boards emphasize that given the complexity, the expected large number of investment proposals and the limited time available for completing contracting procedures under the programming period (as the funds must have been used by the end of 2015), there was a need to streamline and standardize the processes for the project preparation, appraisal and implementation. Having a common approach applicable throughout the country may limit administrative costs and efforts and may shorten the project development and implementation process.

The project is based on a 60% co-financing from ERDF and State budget (83% - ERDF and 17% - State budget) and 40% co-financing from the Local Public Authorities and the associations of owners.

Co-financing rates of the Local Public Authorities and the associations of owners (total 40%) can be modulated so that households (owners) co-finance:

- 10% of the cost where more than 50% of the apartments of the block have average monthly net income less than 150 Euro per family member;
- 20% of the cost, where more than 50% of the apartments of the block have average monthly net income between 150-350 Euro per family member;
- 30% of the cost, where more than 50% of the apartments of the block have average monthly net income between 350-500 Euro per family member.

The remaining co-financing up to the total share of 40% is covered by the Local Authority. Buildings in which more than 50% of the households have higher income than 500 euro/family members are not eligible for the subsidy, so there is an upper eligibility threshold for the program.

The system of EESRB is 'First-Come-First-Served' as the ROP time restrictions do not allow several rounds of calls for applications. Also the level of state support is not linked to any particular impact level. Therefore only the eligibility criterion is used for the evaluation of applications by the Evaluation Committee.

Selection criteria for the projects that are included in an application may be defined by Local Authorities, according to their own policies and priorities. They may be defined in accordance with the Urban Development Plan (if one exists) or in order to solve certain district heating (DH) problems (e.g.

to give priority to EE investments in areas of shortage of capacity of the DH system), etc. However in practice, local authorities also seem to decide on first-come-first served basis.

The block of flats eligible are very similar to those included in the previous (governmental) program: residential blocks built in the period of 1950-1990. The HOAs must fulfil all requirements foreseen in the administrative regulation (list of property owners; enrolment request and decision; mandate agreement with the local authority; decision on co-financing). The mandate agreement must be signed by the 2/3 of the owners (except if the project includes energy efficiency measures applicable in all individual apartments (like for example the rehabilitation of the heating system). In this case it has to be signed by 100% of owners – including the owners of the spaces for non-residential use).[9]

One of the most sensitive elements of the eligibility is related to the spaces with non-residential use. The call of the subsidy scheme says that the owners of spaces of non-residential use (shops, offices, etc.) have to finance entirely the cost of the EE measures corresponding to their property which creates a big impediment for applications and paralyzes the process in many buildings.

The projects have to fulfil some quite strict technical eligibility criteria as well. It should result to at least 40% energy savings in consumption for space heating in comparison to the relevant consumption before implementation of the measures, and achieve specific energy consumption for space heating no more than 90-110 kWh/m²/year (depending on climatic zones)

The beneficiary of the project is the local public authority. They must have the capacity to implement the project, and it is required to set up a Project Implementation Unit (PIU) consisting of qualified professionals. This Unit coordinates and manages the implementation of the projects with reimbursement and non-reimbursement financing, as well as EU and other international grants.

In the project preparation phase PIUs play the most significant role. Their specific tasks include disseminating information about the EESRB to association of owners, engineers, construction companies and other target groups; organizing surveys to identify candidate projects and collecting expressions of interest from associations of owners; assessing whether basic eligibility criteria are fulfilled; preparing justified proposals to the City Council about the list of buildings/projects to be included in the Scheme and submitting applications for evaluation and approval. They are also responsible for implementing the quality control throughout the whole process and executing the public procurements for constructors.

The applications submitted by Local Authorities are assessed by Regional Development Agencies (RDAs). The evaluation is performed in two steps. First, the evaluation of the administrative conformity and eligibility of the financing application against the EESRB requirements is examined which is followed by the technical evaluation of the application. If the project is accepted (selected), the PIUs prepare and approve tender documents and also organise the tendering procedures, tender evaluation and contracting for construction works. Upon completion of works, the association of owners are handed out all relevant technical and other documents including the Energy Performance Certificate (EPC).

Results and impacts of the program

The outputs and impacts of the thermo-rehabilitation program are significantly affected by the amount that the central government allocates for this purpose. Unfortunately the budget allocated by the Government for the domestic thermal rehabilitation of buildings was reduced from originally planned

[9] PORegional 2007-2013, Ghidul solicitantului

RON 32.9 million (around €7.8 million) to RON 22.3 million in 2009 and from RON 40 million to RON 11.7 million (around €2.8 million) in 2010 as a result of the budget constraints stemming from the crisis.

On the other hand the EU financed EESRB program had quite impressive results compared to its short time duration. According to the Ministry of Regional Development and Public Administration, 139 requests for funding (CF) were signed by June 2015, comprising over 968 buildings consisting of 49 475 dwellings. The 139 signed contracts amounted to 1 052 162 788 RON (apr. € 238 million) from which ERDF provided 478 673 160 RON (apr. € 108 million) and the state provided 105 239 546 RON (apr. € 23,8 million). The rest was paid by the local municipalities and the owners.

A specific feature of the Romanian scheme, affecting significantly the result of the program is the high subsidy intensity (10-30% own share, 70-90% subsidy) paired with high technical requirements. For achieving at least minimum 30%-40 energy saving, very complex interventions are needed. So the high energy requirements require higher investment from the public as well as from the private parties.

Social targeting of the support program in the framework of the Regional Operational Program seemed to be a half-way solution. In general it is an innovative idea to require less co-finance from those buildings where the share of more vulnerable groups is higher, however the technical complications practically eliminate this idea, ending in a more or less unitary 20% own-share.

The introduction of a loan guarantee scheme did not automatically helped to foster the lending schemes applied by commercial banks. The banks still require individual liens and joint loans are quite rare in practice. This shows that it is not enough to implement a guarantee scheme, there are other conditions to be fulfilled in order to convince the commercial banks on implementing innovative lending practices (e.g. long records with operating funds of condominiums, better risk assessment methods, lower level of arrears regarding common fees).

4.2.4 Slovakia

The Ministry of Construction and Public Works of the Slovak Republic prepared and submitted a Building Renovation Concept, based on a careful technical investigation of the building stock in 1996-1998The Building Renovation Concept with an Emphasis on Housing Stock Renovation highlighted the crucial problems of multi-family buildings mainly concerning their systemic defect, thus the first efforts to support the renovation of block of flats concentrated to these types of interventions. Energy issues were emphasized later on, but always with a clear emphasis that the basic structural problems have to be solved as well.

Currently the following subsidy schemes are in operation:

Table 9: National subsidy schemes for EE interventions

	1991					1996				2000				2004			2007								2015
Contract savings (Bausparkasse) schemes																									
Grant for eliminating systemic defects																									
Loan from the State Housing																									

Development Fund																										
Bank guarantee for renovation loans																										
SlovSEFF, sustainable energy financing facility																										
Jessica scheme																										

The Slovakian subsidy scheme is mainly based on a grant program (Grant for eliminating systematic defects) and a loan program (Loan from the State Housing Development Fund – SHDF). This dual system (high subsidy – 70% grant - for limited types (6) of systemic interventions versus low subsidy – interest rate subsidy- for wide range of interventions) has developed and evolved during the years as follows:

- Step 1: After detecting the huge renovation need in the multi-family residential sector in 1996-1998 there was an urgent need to introduce a scheme that is able to help eliminating the most severe damages. The grant for eliminating systemic defects (that were originally grouped into 6 categories than enlarged to 12) was targeting the former socialist housing stock with a 30% and 50% subsidy rate. This scheme was extensively used from the very beginning.
- Step 2: Besides the grant scheme a loan program was set up in 2000 in the framework of the already existing State Housing Development Fund. This loan program (provided by the Fund itself) occasionally supported energy efficient interventions, but its main focus remained the elimination of systemic defects. By means of the fund two parallel systems were set up, and the loan was not really popular till the end of the 2000s as there were too complicated administrative requirements applied and serious collateral was an obligation (guarantees and liens).
- Step 3: The loan program became more popular when the administrative barriers were eased and the budgetary cut backs on the grant program became visible. In parallel the grant program became more restrictive in its content (only 6 systemic deficiencies out of the 12), but more ambitious concerning its subsidy content: 70% subsidy instead of 50%. The basic logic of the dual system is currently the following: grant for implementing the most urgent interventions and loan for the interventions that result in more savings in energy or maintenance cost.

Main characteristics of the subsidy schemes

State Housing Development Fund (SHDF) is a major tool to finance several types of housing interventions governed by the state (e.g. building social housing, renovating the municipal stock, supporting the construction and thermal-insulation of family houses). In the field of renovation of multi-family buildings the Fund provides only loans focusing on the following action till 2014: 1) the reconstruction of systemic defects of buildings (referring to the 12 systemic defects the list of which was finalised in 2006), 2) insulation of the building envelop. Inside the multi-family building stock structural deficiencies can be eliminated in all types of buildings meanwhile the buildings to be insulated must be officially registered before 2002. (Taking into account the extremely large share of housing estate blocks built in the socialist era the subsidy aims mostly to improve their conditions. Before 1 of January 2014 – the latest law on SHDF – it was exactly stated that building built before 1989 were eligible for the subsidy. From 2014 the system is open for newer dwellings.)

In case of the first set of interventions (systemic defects) it is obligatory to implement at least minimum activities listed in the law. However in the first years of the operation of SHDF minor interventions were allowed to accomplish but currently complex interventions are required. E.g. in case insulation is implemented the whole envelop must be insulated including the windows, façade, the roofs, basement, balconies. In case of thermo-insulation interventions there is a precondition to reach at least 35% energy saving as a result of the intervention. The thermo-insulation of the building in itself is appropriate to eliminate 9 out of the 12 systemic defects that are in the eligibility list. However insulation does not mean that one can hide systemic failures: e.g. before installing the insulation one has to follow strict instructions to eliminate cracks and improve the degraded concrete.

Support may be granted for the removal of individual failures of residential buildings separately or simultaneously. For each type of system failure it is possible to provide support during the life of residential building only once, however the same community can submit applications several times but for different parts of the building. In this scheme there are different interest rates: e.g. combining two interventions result in choosing the lower rate from the two possibilities, combining 3 interventions means the lowest interest rate - 0,5%. Even 0% interest rate can be achieved. By this combined interest rate system the Ministry aims to encourage implementing more complex interventions.

From 2013 SHDF loans are financed not only from national resources but from the resources of the EU's Jessica Fund. Jessica Fund was included into the system to finance purely the insulation of multi-family buildings with very similar conditions than the original SHDF loan – and operated by the same system. From 2015 Jessica finances practically all kind of renovations as the SHDF itself. The difference between the two loans currently lays only on the duration of monitoring of consumption of heat: SHDF requires 3 years monitoring while Jessica requires 5 years. (Soon the national monitoring will also be 5 years.) In practice the applicant submits the application to the SHDF and the Fund will allocate the financing from that budget which is available (either it is state budget or Jessica source). The preferential loan can reach 75% of the investment costs, however the 25% own share can also be financed throughout financial institutions in a form of commercial loans.

The scheme basically seems to remain the same in the 2014-2020 budgetary period. The new conditions are applied from January 2016 and reflect minor changes towards further loosening the barriers by increasing the eligible cost limits and including new types of interventions.

The grant scheme for eliminating systematic defects was introduced in 1998. 50% of the renovation costs could have been financed by the state in case the goal is to eliminate certain systemic defects of multi-family buildings. The subsidy could not exceed 19 euros/m² of floor area. In 2006 there was already a list of 12 types of systemic defects the elimination of which was supported by the grant scheme. By 2013 all the 12 systemic defects could have been supported however with different subsidy rates: structural deficiencies remained in the 50% subsidy rate while interventions that have some kind of effect on savings (like energy efficient interventions) can get only 30% subsidy. When removing two or more system failures in one apartment building, the subsidy amount was determined as the sum of the subsidy calculated for individual system faults. Showing the sign of improvement the list of eligible systemic defects has been currently shortened from the former 12 to 6. By now only life threatening defects remained on the list, like the protruding construction of balconies, loggias and stairs. In return the aid intensity has increased from 50% to 70% to provide incentives to home owners to carry out the most urgent renovation works.

Subsidy provision process and the role of different actors

The process of application of SHDF loan is initiated by the home owners represented either by the home owners association itself or by professional maintenance company (mainly generated by the

manager of the building). A decision of 2/3 majority of all the owners is required to support the participation (since 2010 it can be collected in a written form independently from the general assembly meeting). As the application procedure requires significant technical and administrative knowledge there is a need to involve technical experts from the first steps. The existence of a systemic failure must be demonstrated by an authorized civil engineer including the results of diagnostic of the construction of a building with a description of a system fault, the extent and degree of damage, the proposed method to eliminate it and the approximate cost it will take.

In addition to the cost of energetic evaluation and the cost of expertise on systemic failures there are other transaction costs to be paid by the owners, like cost of project documentation, conversion fees, extra management fee, bank fee. All of these costs make up about 5.000-10.000 euro/project.

The applicant shall submit a written application to the Fund through either:

a) municipality, which is the seat of the district [10],
b) municipality of the city district, in case of Bratislava and Kosice city.

The respective district municipality verifies the requirements in order of receipt of the request, than it sends the application to the Fund in order of receipt of the request. Thus the municipality has an administrative role in not really filtering (evaluating the substance of) the projects, rather checking them from an administrative point of view. The municipality is also an important communication point that spreads information towards the home owners associations.

Within 90 days of receipt of the written copy of the application shall the Fund asses the application and notify the applicant of the possibility of providing support. The Fund will send the applicant a draft contract within 30 days after the supporting decision. The decision is made on a first come-first served basis. All the projects that proved to be eligible and can be financed up to the state financial limits can be supported [11].

Clients in contractual relation with the State Housing Development Fund had their credit account (specialised for the loan) conducted by 2 commercial banks-Prima Bank and OTP banks and Slovak Guarantee and Development Bank. However since 2014 all the accounts of clients of SHDF are being conducted by the State Guarantee and Development Bank.

The State Housing Development Fund operates similar to a commercial bank in many respects. The clients can choose from three types of collaterals to secure the loan approved: pledging the operation, maintenance and repair fund, paying for bank guarantee, putting a lien on common/individual property. Naturally close to 100% of the applicants choose the fund to be the collateral.

After completing the project the borrower must provide data on the energy consumed for heating for 3 (in case of Jessica funded loan 5) years in order to prove that the energy saving is more than the minimally required 35%.

The grant for eliminating systematic defects requires a written request for subsidy by the applicant to the Ministry, through the District Office at the seat of the region. The owners must decide with a 2/3 majority on starting the application.

Applications are evaluated based on selection criteria which are published every year by the 15th of January at the latest. Those applications are preferred in general that 1) were submitted in an earlier

[10] Slovakia consists of 79 districts (with some tens of thousands of inhabitants each) and the capital is divided into 5 districts.

[11] Some HOA managers complained that if the building is located in a big city and the application is submitted to the local authority it may not be able to verify all the applications in time (as there are too many) and the HOA may obtain a bad position in queueing for the subsidy on national level which is awarded on first come-first served basis.

date, 2) in which the projects are more complex, 3) the owners contribute each month to the operation, maintenance and repair fund with a substantial amount.

Applications which meet the conditions for granting subsidies are ranked according to the selection criteria set by the Ministry. The District Office at the seat of the region sends ranked applications according to the selection criteria to the Ministry till the 31st of March. Ministry following consideration of applications provides grants up to a maximum amount from the state budget for the financial year. The District Offices at the seat of the region are the organisations that also control the use of the funds and check the implementation of the projects on the ground in cooperation with the Ministry.

As the subsidy finances up to 70% of the cost of interventions the remaining part should either be available by cash or by a bank loan from a commercial bank. Subsidy must not be combined with the loan from the State Housing Development Fund, which means that the renovation of the same part of the building cannot be implemented from these two resources at the same time. There are some cases however when a systemic defect would be eligible to be financed by the grant, e.g. fixing the life-threatening balconies, but HOAs tend to build these requests in a loan scheme as part of the insulation of the walls – which means that the interventions will be more complex.

Results and impacts of the program

By now, a substantial share of the housing stock has been renovated to some extent in Slovakia. The estimated share of the multi-family buildings (concerning their number of units) that implemented substantial renovation is about 50% (that would result in buildings including approximately 500.000 dwellings). The output data of the SHDF loan and the grant system operated by the Ministry of Transport, Construction and Regional Development indicates that approximately 300.000 were assisted by the subsidies. However, we have to assume that some buildings obtained the subsidy more than once, so there has to be some (but not too big) overlap in this number. It means that there was a significant room for projects financed from own resources and/or the use of EBRD or commercial loans.

The amount devoted to providing SHDF loans for renovation of the (mostly) multi-family buildings is substantial compared to the size of the country. However we have to note that it is a revolving fund, so after 15 years of operation by now approximately 40% of the funds are coming from the state (CO_2 emission and EU funds) budget, while about 60% of the funds are repayments of the previous loans. Thus the Fund started to be partly self-sustainable.

One of the most relevant changes of the scheme is the growing importance of quality control. In the first period of the scheme there was no emphasis on this factor however currently only companies with special licence and certified materials can implement the renovation projects. In general the technical requirements are becoming more and more strict (e.g. 5 cm of insulation was acceptable some years ago, while currently 12 cm is the standard and it is going to be stricter next year). The building is technically audited before the project and there is a must to contract an independent supervisor to monitor the construction works (the Fund also controls the quality when paying directly the contractor). Companies that implement the supervision must have a licence that they receive from the Slovak Technical Construction Office.

The Slovakian subsidy scheme shows that if a grant system with significant subsidy rate has strong budgetary limitations and it is concentrated more and more on certain interventions, and as the preferential loan provided through the State Housing Development Fund doesn’t have substantially

higher subsidy content than the commercial loans (appr. 5-8%[12]), but requires substantial administrative procedures and costs, home owners' associations tend to implement the renovation from their own resources combined with commercial loans.

The Slovakian scheme is largely based on the integrity and capability of home owners associations that work on the tendering documents, contract and pay for the technical audits, contract out the construction and manage the whole process. Interestingly, the Fund pays directly the constructor and takes part also in the quality control process. These high organisational demands linked with the relatively low subsidy potential results that those buildings can implement such interventions that have the organisational and financial skills to do so. On the long run this fact may build a serious barrier against including all buildings into the renovation schemes.

4.3 Lessons learnt from the subsidy schemes

The subsidy schemes have been operating in Central European countries for 10-15 years and have affected about 15 to 25 percent of the multi-unit housing stock in Hungary, Poland and Slovakia (substantially less in Romania, where the subsidy programme has a shorter history).

Most of the subsidy schemes remained relatively stable in the last decades: there were only smaller changes in their legislation with the aim of refining goals and targets, and often the effects of the financial crisis temporarily decreased available state resources.

As it has been stressed, the evolution of the schemes can be characterised by the following patterns:

- Slightly decreasing subsidy levels;
- Increasing technical requirements regarding the complexity of interventions;
- Increased importance of quality control;
- Intensive use of EU funds as supplements/alternatives to domestic funds which importance is further increases in the 2014-2020 budgetary period.

Receiving subsidies was a decisive motivation for the residents to implement energy efficient interventions. Interviews with residents revealed that energy saving is only one important motivating factor in case of energy efficient interventions: the increase of comfort level, the increase in real estate value and the urgent need to solve structural problems are similarly important motivating factors. The importance of subsidies derives also from the fact that they make it possible to get a reasonable value for the contribution people are able and willing to pay for renovation purposes. With regard to the amount of household contribution interviews also revealed that residents, when deciding for interventions, do not seem to be entirely rational on financial matters. They seem to be influenced by a theoretical limit of monthly payment they are willing to pay for the renovations, which is most often not calculated with savings and financial details in mind.

[12] The SHDF can provide loans with 0-1,5% interest depending on the complexity of interventions, while the market can provide a renovation loan in close to 4%. Calculating the difference in 10 years time with an inflation of 1% about 5-8% difference in present value occurs.

Preconditions for initiating subsidy schemes

Generally, the existence of legal, financial, and economic stability were important preconditions for starting and maintaining a successful subsidy scheme. However, there were differences among the CEE countries.

Most subsidy programs for supporting energy efficient interventions started in the late 1990s and early 2000s. By then certain institutional arrangements – like a relatively solidified housing ownership structure and a clear division of responsibilities in maintenance – were achieved. Likewise, there was a stable financial system, and after the steep economic decline of the early 1990s, growth began and the countries have reached a certain GDP level (by 2004-2005, when the subsidy schemes started to produce mass results the GDP levels reached 5400-8300 euro/head – according to Eurostat).

The legal background of HOA operation was stable in 3 countries, with the exception of Romania, where there are still problems even today with the registration of HOAs with approximately half of the multi-unit buildings still not being established condominiums. In all 4 countries HOAs (that were mostly condominiums and for a smaller part cooperatives) were legal or quasi legal entities that had their own bank account, and were contracted to maintenance companies and utility companies.

There are possible ways to prepare for the establishment of a subsidy scheme. This is not a necessary precondition, however it might contribute to the success and targeting of the program. The efforts of Slovakia can be highlighted here where a survey of the building stock took place in 1996-1998 in order to estimate the value of the maintenance lag. Romania also investigated the subsidy schemes already available in the neighbouring countries and the experts of the Commission prepared a survey of the building stock (JASPERS Knowledge Economy and Energy Division). In Hungary and Poland no extensive survey has preceded the introduction of the subsidy scheme. With or without any survey, the subsidy schemes produced poor results in the first years. The reason behind could be manifold, one being the unsuitable subsidy conditions (e.g. too low subsidy rate or a loan system instead of a grant). In addition, it also seems to be true that any subsidy scheme needs time to be known by the stakeholders.

In all cases the breakthrough of the loan but also of the grant programs can be tied to the elaboration of feasible joint loan products to home owners' associations (HOAs) by commercial banks that enabled them to complement grant schemes or to utilise loan ones. All the examined grant schemes became successful only after HOAs were able to access co-financing through banks. In order to develop such products, banks needed to have experience with HOAs (renovation funds managed by commercial banks created a good basis for this); and banks had to develop collateral schemes which could be adapted to joint loan solutions. In all countries renovation and operation funds used as the main collateral was a crucial tool in the expansion of energy efficient renovations and HOAs have turned out to be far more reliable borrowers than individual debtors. In addition, the duration of renovation loans have to have a sufficiently long maturity. Five year loans to HOAs will only encourage small scale steps, while at least 8-10 year loans allow complex interventions.

It is also a question whether guarantee programs were successful in encouraging banks to develop new products for HOAs or not. Experience is controversial in this field. It seems that the Slovakian and Romanian state guarantee schemes were far too complicated and expensive for the market and did not contribute to the development of new financial products. On the other hand IFC guarantees seem to have strengthened banks' willingness to enter the market in Hungary.

Forms of subsidies

There was no perfect recipe for subsidy intensity and form. All four countries followed different paths. using both loans and grants. However, what seems to be proven is that an original higher subsidy intensity was helpful in kick-starting the programs. Furthermore, the overall success largely depended on the stability of the available subsidies – the more reliable and stable, the more rooms HOAs, banks and entrepreneurs had to develop their products and adapt to the circumstances.

As it will be shown both loan and grant schemes have their advantages and disadvantages however it seems to be clear that without proper legal background of the HOAs and proper bank lending mechanisms a loan scheme cannot be successful.

Although the forms of subsidies have changed over the years, here are the most important country specific ones:

- 33% state + 33% municipal grant (is not a must any more)+ interest rate subsidised loan in Hungary, decreasing subsidy intensity over the years
- 20% bonus provided to commercial bank loans in Poland
- 70% grant (formerly 30-50%) OR nearly interest free loan throughout the State Housing Development Fund in Slovakia
- 50% state + 30% municipal (or 60% EU+state and 10-30% municipal) grant in Romania.

The bonus was provided through loans in Poland, where the intention was both to reduce state administrative costs and to engage interested actors – the banks – who took on the responsibility of checking the financial stability of the HOAs. Thus the target group consisted of only those HOAs, who were eligible for a commercial loan, deliberately leaving the poorest HOAs aside. (For 5 years there were very few buildings that were able to obtain the bonus provided to loans.) In Slovakia there were also attempts to introduce a loan system but it became unsuccessful thus a grant scheme was strengthened besides. After several years the loan subsidy became more successful (due to the development in commercial credit products) and the amount of money spent on grant was reduced significantly. In Romania neither the HOA system nor the HOA crediting system is developed enough to introduce a loan based subsidy system, thus a grant scheme is applied with a high subsidy rate. In Hungary the subsidies for condominium loans existed from 1988 but became popular in the middle of the 2000s when new collateral solutions were developed and grants were introduced to reduce the upfront costs (and loans became tools to co-finance grant schemes).

Based on the experience of the almost 2 decades of operation, it seems that programs utilizing loan schemes are more stable: they create less burden on the public budgets and after several years they became partly rechargeable. In addition it is also visible that loan schemes are more close to market solutions: thus majority of the housing stock is renewed without any subsidies in Poland and Slovakia where the subsidy content is low anyhow. On the other hand the low subsidy content seems to limit the participation of the less affluent communities where more low income households are numerous. In Romania the initial subsidy content was 33+33% (as in Hungary) which turned to be too low to raise enough interest, mainly in light of the serious technical requirements tied to it. Decision makers decided to increase the subsidy level into 80% which raised interest at least in wealthier cities. In Hungary the subsidy content was very high thus the budget framework was emptied shortly after the submission deadlines all the time.(However many buildings still did not join the subsidy scheme due to the lack of proper own-share and the unwillingness to take risks.) Importantly in Hungary the high subsidy rate resulted in market distortion: there was a serious increase of construction prices in case of subsidized buildings often also the quality parameters were ignored. As the grant put a huge burden on the public budget it was terminated with the beginning of the financial crises. With constant hope

being fuelled by rumours of opening the scheme again, very few HOAs engaged in market based renovations.

Slovakia implemented a very interesting combination of loan and grant schemes: 70% grant is provided to repair 6 types of structural deficiencies while interest rate subsidy is provided to rather energy efficient interventions (that have a saving component).

In Hungary and Romania the subsidy was provided jointly by the state and the municipality. This is a favourable condition from a co-financing point of view, and it also helps to decentralise many decisions. However it might cause higher transaction costs and more time for approval. Both countries tried to solve this problem by introducing a mechanism for role-sharing: the local municipalities provided the technical assistance and the stronger evaluation of applications while the state co-financing was rather automatic (up to the budgetary limits). The municipalities became very strong actors in these two countries: by providing technical assistance (in Romania also technical audits, assistance to tendering and quality control) and co-financing they could significantly influence the number of buildings being renovated. This also had a consequence of contributing to spatially very diverse use of the state subsidies. In Hungary the most devoted municipalities had nearly all their housing estate buildings renovated while in other places there are only few buildings renovated in other places. It shows the strong political nature of the whole issue.

Subsidy systems also became more sophisticated with time: more complex interventions could get somewhat higher subsidies in Slovakia, and there were a few cases also in Hungary. These facts call the attention to the possibility that having the experiences after some years of subsidizing any scheme can be restructured in a more sophisticated way.

In all subsidy schemes the transaction costs are high as expertise is needed for the technical audit, the application itself and the quality control. Furthermore, as time passed the entry level requirements for the subsidy scheme increased quite significantly - now there is an obligatory energy saving level to achieve (25-40%) – making the interventions more costly. Finally, in some countries the construction costs also increase in case of subsidy, in some countries the loan schemes require the credibility of the HOAs. All these instances contribute to exclude the least affluent HOAs from the subsidy schemes.

Concerning the role of ESCO companies in these schemes we can observe very limited participation from their side. The reasons behind are several, like 1) the residential sector is much more complicated from an ESCO point of view than the SME or the municipal sector, 2) as the subsidies or good financing solutions are targeted to the HOAs themselves there is no need for third party financing, 3) the ESCO services increase the price of renovation and the performance guarantee the ESCO may provide in return is not highly appreciated.

Concentration and targeting

Given REELIH's preference for targeting the subsidies for the socially vulnerable, and to concentrate them on multi-apartment buildings, it is essential to look at how the CEE countries have fared with regard to this. The review showed that concentration and targeting of subsidies was an insignificant part of the programmes. Poland did not formulate any strategy: all types of multi-family buildings were eligible for the subsidy (in addition to the family houses that did not apply intensively for the subsidy in practice). In Slovakia also all multi-family buildings were eligible (except that insulation could have been implemented only in buildings built before 2002). In Romania blocks of flats built between 1950-1990 comprised the targeted stock of the schemes (however individual flat owners were also eligible). In Hungary the focus was on housing estates built by industrialised technology (only in the later

subsidy rounds buildings built with traditional technologies and family houses could be involved). In general the planners had the big housing estates in mind as an overwhelming part of the multi-unit buildings are pre-fabricated in these countries. There were already frightening signs from Western-Europe that housing estates tend to empty out and slum thus it was a warning to Central-Europe as well. Consequently the physical condition of mostly pre-fabricated buildings entered the centre of attention. Taking into account that the renovation of those buildings is proportionally less costly than in case of family houses while the voting power of residents in these buildings is strong, this topic became an important one in most Central-European countries.

Concerning individual targeting only Romania considered it seriously (due to the requirements of the EU that provided the funds for the latest subsidy scheme). The own share of the HOA in the Romanian subsidy scheme depended on the official income of the residents ranging from 10-30% of the investment costs. However the time and costs of individual income-check and the fact that most building falls into the 20% own-share category made Romania reconsider this targeting scheme and currently they rather intend to subsidize more intensely individually those ones that get official social allowances. In all the remaining 3 countries the schemes have had a (non-declared but indirect) preference of the wealthier HOAs.

5 BARRIERS FOR TRANSFERRING THE LESSONS LEARNT FROM THE CEE COUNTRIES

The common socialist inheritance, the similarities concerning the housing sector, some similarities in the challenges faced during the last 25 years as well as the important differences arising from geographical position, political alliances and the economic and institutional surroundings all influence the adaptability of the CEE energy efficiency intervention models in Armenia and Bosnia. Although some basic lessons can be used in case of both countries, as the ensuing recommendations will spell out in detail, the specific characteristics influence vastly the selection of certain measures, and the degree to which they can be used in a specific institutional surrounding.

In the following we briefly overview the most important differences and similarities among the two countries, that are regarded crucial from the point of view of adapting a well-working CEE subsidy scheme to finance energy efficiency interventions. We start with comparing the countries to each other, singling out the most important similarities and differences, than we proceed to comparing them to the CEE region with regard to their most important characteristics.

5.1 Comparison between BiH and Armenia

Despite the seemingly different political paths the two countries have taken in their post-Socialist period, one very important common feature affecting their current economic and institutional decisions has been the devastating war raging in the early 1990s that has left both countries in great economic despair. In case of Armenia the war for the Nagorno-Karabakh region meant that in spite of the fact that the core area of the country was not bombed, the economic despair reached a point, where buildings were taken apart partially, and the district heating system collapsed, leaving a dilapidated housing stock behind that has not had the opportunity to recuperate ever since. This, together with the previous earthquake also meant that there was an important population movement within Armenia. In case of Bosnia, the war not only meant that the building stock was badly damaged – about half of the stock was destroyed, and this destruction was even more prevalent in the countryside - but also that it was partly abandoned, as a result of large-scale war time displacement of the population. The effects of the war on the housing stock can be demonstrated by the fact that in Sarajevo by the end of the war three out of the four municipalities had a rate of building damages between 74 and 96 percent, and the city – just like the entire BiH - was heavily dependent on external aid in the process of reconstruction as the war ended (Martin-Díaz, 2014). During the war the displacement affected about half of the population, 25% being internally. This mostly affected a movement from the rural to the urban areas, where there was available housing, additionally contributing to the growth of urban poverty (Kačapor-Džihić and Oruč, 2012).

Migration not only matters with regard to movements within: in both countries the population has left in great numbers to live abroad, supporting their home country with substantial remittances. In 2007 the International Monetary Fund estimated that about 25% of the Bosnian population lived abroad contributing to approximately 30% of the GDP in the form of private transfers (IMF, 2007). A more radical estimation was provided in 2011 by the Bosnian government that put around 43% the share of citizens living and working abroad (Kačapor- Džihić and Oruč, 2012).

In case of Armenia the historical circumstances including the long tradition of forming diaspora in connection with the constantly changing political shape of the country, mean that today it is estimated that besides the 3 million people living in Armenia another 7 live abroad, most importantly in Russia, the United States, France, Argentina, Lebanon, Syria, Iran and Turkey. The most important target for work related migration is Russia. Given the importance of the migration and diaspora issue, Armenia

has a special Ministry for Diaspora since 2008 (ILO, 2012). In 2014 the World Bank reported that about 21 percent of Armenia's economy derives from transfers from abroad (Grigoryan, 2015). Based on national polls, it was estimated that in 2013 for about 17% of all families in Armenia the only source of income was from remittances sent by their relatives working abroad (Arka, 2014)

The importance of remittances in both countries influences strongly the possibility of introducing any kind of targeting mechanism in the subsidy schemes: they distort strongly the real income of the population. Furthermore, remittances are hard to account for when banks are considering the household incomes, which also showcases the importance of creating the legislative framework for and adapting lending practices where the account of the condominiums are pledged when they take loans.

The political alliances of the two countries are different: whereas Armenia forms part of the Commonwealth of Independent States (CIS) and basically can be considered a very important ally of Russia, it is more complicated in case of Bosnia. Here the role of the US has been crucial in bringing about the Dayton Peace, and generally, it has retained a very important role. Russia's influence is the most tangible when it comes to the Republika Srpska.[13] The entity pursues independent policies from the Federation in many respects, among others in energy policy. As part of this attempt in 2012 it signed up for the Russian sponsored – since failed – South Stream pipeline, and the deal included building gas power plants in the territory of the entity (Jukic, 2012). Unlike the Republika Srpska, the Federation with a Bosnian and Croatian majority has been leaning more clearly towards the European Union and the United States.

The EU, although its influence is present in Armenia, is chiefly achieving it by making its funds available in an attempt to try to influence the policy decisions. In case of Bosnia however, its presence is felt much stronger: not only its geographical proximity and the stronger trade ties, but Bosnia has a signed Stabilisation and Association Agreement that establishes a close partnership between the parties, forming the main framework for the relations between the EU and BiH, and further preparing the country for a possible future EU membership (European Commission, 2015).[14]

Political alliances and influences matter in respect to the options a country has in securing cheap and reliable energy on the one hand, and in the existence of pressure to invest into energy efficiency.

There also seems to be a big difference between the economic situation in the two countries: both the household income levels, the percentage of households living under the poverty line and the GDP levels show that Bosnia is significantly wealthier than Armenia. Although there are a lot of uncertainties surrounding the GDP data, and different organisations have somewhat different estimates as a result of changing methodology, there seems to be a 25% surplus economic productivity for Bosnia. In 2013 the per capita nominal GDP was 3,500 EUR, whereas the same data for Armenia was 2,600 EUR.[15] Despite the better economic circumstances, normally a good perquisite of introducing a successful program of energy efficiency interventions, the complex system of public administration – the result of the balanced Dayton Agreement – is regarded by many as an impediment of progress and further development in BiH. For Armenia the centralised political structure could be more helpful to implement a successful energy efficiency program, based on the CEE models.

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[13] See among others on the growing influence of Russia

[14] Press release of the European Commission, July 1st, 2015

[15] Agency for Statistics for Bosnia Herzegovina and http://data.trendeconomy.com/indicators/Nominal_GDP_per_capita/Armenia The USD based data was converted using a 0,75 ratio, prevalent in 2013.

5.2 Comparison with the CEE countries

Regarding the comparison with the CEE countries, one of the most important similarities concerns the common Socialist past. This has far-reaching consequences with regard to the housing stock of both countries: although damaged as a result of the wars and never as good quality as many in the CEE region, there are the same massive housing structures built under Socialism, with very similar physical features, meaning that – with restrictions - many measures tried and employed in the CEE energy policies can be adapted both in Bosnia and Armenia.

Interestingly enough, although much attention has been paid to the effects of the regime change on the urban structure and the housing stock in the ex-Socialist countries, very little has been written about how these factors can be further aggravated and even changed as a result of war and ethnic conflicts (Martin-Díaz, 2014). This is surprising, as one major difference regarding the physical problems concerns their magnitude. Partly because of the lower quality of the original stock, the general lack of maintenance and finally because the war, or that residents in need ravaged the buildings themselves, the building stock both in Armenia and BiH suffer from bigger physical problems than generally the building stock in the CEE region usually suffered. This in turn influences strongly the adaptability of many CEE policies, and pushed stakeholders to examine more carefully the policies aiming to invest into structural deficiencies.

The massive privatisation of the 1990s took place in Armenia and BiH similarly to the CEE countries, meaning that by now the buildings are in private hands, leaving their relatively poor owners with the task of maintaining their buildings However, unlike in the CEE countries, where despite the initial difficulties, the legal regulation of the HOAs allowed for a decent building operation, both in Armenia and in Bosnia there are legal problems that create additional difficulties both with regard to maintenance and new investments. These difficulties – that are listed in detail in chapter 6 and 7 – present major barriers currently to adapting CEE policies and practices in the realm of energy efficient refurbishment.

These problems are further aggravated by the fact that the economic development level of both countries, despite years of massive growth starting from the second half of the 1990s, and ending with the crisis of 2008, is still significantly lower than it was in the CEE countries when they started the energy efficiency programs for the residential stock. Although it is not really possible to set a threshold GDP level for the introduction of such programs – currently they are about half or a little less for BiH and Armenia compared to the CEE average when the programs accelerated - it is however safe to say that both the limited national and household resources present an impediment to really operate any energy efficiency program available to a wide audience in both countries, and to adapt the models followed by the CEE countries.

6 RECOMMENDATIONS FOR ARMENIA

6.1 Definition of the problem/gaps

Given the complicated nature of Armenia's political allegiances, the economic difficulties it faces and its housing stock, that is not only privatised but lacks investment both from its new owners and the public bodies alike, the creation of a sustainable system for fostering the energy efficient renewal of the housing stock is both of crucial importance and a hard task to achieve. Even among the best of circumstances there are many questions in the creation of a system aiming at the large-scale renewal of the multi-apartment buildings that are hard to answer. These regard most importantly the desired/achievable subsidy intensity, the proper definition of the target population and the long-term sustainability of such an endeavour. However, in case of Armenia there are specific challenges that arise from the circumstances the country has been facing as a result of its Socialist past – most importantly the physical state of its housing sector and the consequences of the give-away privatisation – coupled with the economic woes and social difficulties it faces today on a daily basis. Also, the current report comes as the real estate market only begins to recuperate from the crisis of 2008. The crisis – as it has been stressed by different experts – had many particular features of specific Armenian nature. Most importantly the real estate boom ending in 2008 was among the largest in the world in terms of the share of the economy that the construction sector absorbed. It concentrated chiefly in Yerevan apartment buildings, and was strongly pushed by developers in the informal sector (IMF, 2011).

Based on the reports prepared by HfH Armenia, the literature review and the site visit in the early October of 2015, the following challenges were identified specifically for Armenia in setting up a national energy efficiency system of subsidies:

Challenge 1: Low energy price: One of the most important challenges is presented by the energy prices households in Armenia have to pay that can be considered low in an international comparison. At the heart of the energy price challenge lays a difficultly resolvable contradiction with regard to energy efficient investments into residential housing. On the one hand low energy prices provide little motivation for the households to invest into energy efficiency: reasonable investments have very long pay-off periods when it comes to cheap prices, as both the materials and the expertise for renovation are expensive. On the other hand raising the energy tariffs could mean further increase in the number of households living below the line of poverty and households suffering from energy poverty, as the current allocations of Poverty Family Benefit Program would be insufficient to compensate. What might alleviate the case in Armenia is that as a result of the dismantling of the district heating system the individual metering of the apartments is common, increasing households' willingness to invest.

The low energy prices of Armenia – in international comparison – are mostly made possible by the still very favourably priced Russian gas which in turn contributes to the Russian dominance in the Armenian energy sector. Despite this, as it has been highlighted in a report prepared by the World Bank in 2013, until quite recently energy tariffs provided cost recovery, and the energy sector has reached a level of reliability and service quality that is unique among the other ex-Soviet countries (Kochnakyan et al, 2013).

Recently this trend has changed, and energy prices are lower than it would be desirable from the point of view of cost recovery and development. However, the cost of continuous price increases can be very high: together with the decreasing value of DRAM they not only stretch the adaptability of

households to the economic conditions, but their environmental and political costs can be taxing too. The government's decision to remove the subsidies on natural gas in 2008 led to a 42% increase in gas prices for households, and prompted many households to switch from natural gas as their primary source of heating. This was followed in 2010 by the increase of gas price for residential consumers in the midst of the economic crisis, following a steep rise in the cost of Russian import. Just like before, a shift in the gas consumption could be observed, however it was also proven that there is practically no price elasticity with regard to gas consumption when it comes to heating. Thus, price increases influence the welfare of the households, pushing many below the line of poverty (Ersado, 2012). In the summer of 2015, despite heavy police presence, thousands took to the streets of Yerevan in wake of the government's plan to raise electricity prices by 17-22% (BBC, 2015). As a result of the 6-day-long protest, the tariff increase was suspended (Aljazeera, 2015).

Challenge 2: The generally deteriorating condition of the buildings. As it has been stressed in the overview of the energy efficiency renewal programs in the CEE countries, energy efficiency can become secondary in case large structural deficiencies present in the buildings overshadow them. In Slovakia for example, in order to jump start the program of energy efficient refurbishment, a set of major structural deficiencies had been identified based on a nation-wide survey, whose refurbishment became a top priority, eclipsing such issues as changing the windows or insulating the facades.

In case of Armenia the physical state of the buildings is very problematic. Based on the site visits in Yerevan in two neighbourhoods regarded as mixed, but of middle income by the local guides, the buildings typically suffer from basic shortages like the lack of windows and entrance doors, the barring of elevators on the first three floors of the buildings because of financial restrictions. (This is a costume that was established in the Socialist period already).[16] Further problems include roofs that leak and are in need of dire repair. (The Yerevan municipality repairs annually 30 building roofs, but estimates the need for about 600 altogether. They also invest into about a 1000 smaller renovations annually.)

Finding the appropriate entry point for a national scheme for building renovation becomes difficult, as improving the energy efficiency of a building and improving its structural stability can become contesting priorities. Not repairing these structural deficiencies in Armenia could mean shortening the buildings' life span, and disregarding the fact that they also constitute a major obstacle to raising the comfort level of the residents. Besides, most of these repairs have energy saving potential as well – like the windows installed in the staircases or the repair of roofs in line with their insulation – but it is not necessary, as the example of unused entrance doors demonstrates.[17]

Challenge 3: The HOAs' operation: Very similar to the former Zheks (state owned property management companies) – and often run by the former Zhek representatives – there are clear deficiencies in the way the housing associations work: most importantly, their current operating system resembles a strange mix between a cooperative and a condominium, resulting that there is not enough incentive for the HOA presidents to look after each building, and not enough incentive for the residents to pay their maintenance fees. A further problem is that HOAs seem to have become embedded into the prevalent system, where much is decided by the local political elite, further

[16] Interview with HOA managers in Yerevan during the MRI field trip

[17] A special elastic metal band is fixed on the otherwise open entrance doors for the winter period by the HOA, to make people close the doors, which is open in other periods of the year.

decreasing the residents' willingness to pay the maintenance fees and participate in the building operation.

Finally, it is hard to make decisions – like the sale and leasing of common spaces that can provide vital income for financing renovations – when the owners are hard to reach as a result of the high share of empty apartments. (This also contributes to low collection rates as well.)

Given this background, the maintenance fees themselves are kept very low – usually between 10-30 AMD/m^2/month - about 0,02-0,06 EUR– and many HOA presidents (and the assemblies of the owners) are reluctant to raise it: in case the collection rate is relatively high it is usually enough to cover the maintenance costs, and pushing it higher might contribute to an abrupt decrease of the collection rate. The actual collection rates vary, but it is not uncommon in Yerevan to be around 50-60%, and only in some cases of very good management can it reach around 80-90%. Importantly, the level of collection rate is not in direct relationship with the income level of the residents. Interviews conducted in the field suggest that residents, who often seem unwilling to pay for common causes, are willing to finance relatively expensive investments in their private homes, such as the changing of the windows, installing a new entrance door or a new heating system.

The common fees themselves are collected by one HOA employee, than placed on a joint bank account of the HOA (that consists of mostly dozens of buildings). Despite elected building representatives, the annual compulsory meetings of the owners in each buildings, and the obligatory financial reporting for each building from the HOA management's side, there is a lack of transparency involved in the financial management, allowing to blur the clear financial division between the buildings on many occasions. This financial blur is indirectly acknowledged by the banks: e.g. INECOBANK has refused to give a new loan for an intervention for a Yerevan based HOA for an additional 6 months, despite the fact that the credit would have been taken and the instalments paid back by the association of several buildings.

Although the structural similarity to ownership-based cooperatives that are wide-spread in the CEE countries gives the large HOAs financial stability and a relatively big financial flexibility, which is very important especially if there are low collection rates and the maintenances fees are generally very low, but it also means that there is less attention paid to individual buildings. Furthermore, individual buildings, when part of a larger HOA, can't even possess their own bank account and can't take loans themselves. Within this framework, often surrounded by a culture of distrust, there are not enough incentives for either party – management or residents – to put in the money and energy necessary for appropriate maintenance, let alone carrying out energy efficient renewals in the buildings. Rather, HOAs can function as the motors of very rudimentary maintenance, lacking the means and the vision of necessary investments.

Challenge 4: The legal obstacles related to financing: Part of the difficulties that HOAs have to face on a daily basis is their inability to renovate major deficiencies. Regarding the lack of funding it can be said that it affects buildings with acceptable and good collection rates as well, the reason behind being that taking credits is a complicated business for condominiums. As it is not possible for the banks to put a lien on the individual buildings, the bank is asking the residents to provide personal guarantees, which is both a cumbersome and a time-consuming process. Furthermore, banks do not have experience in working with HOAs and they need to create new procedures for lending to HOAs. The development of these procedures takes time.

A further problem regards the unwillingness/inability/disinterest of many buildings to form HOAs. They collect the necessary maintenance money on an occasional basis, when need arises, otherwise try to rely as much on the local municipalities as possible. (There are big regional differences however,

where buildings in Yerevan function by far the best.) This should not be allowed, as this by definition impedes the buildings to engage in any serious maintenance work.

The range of laws and legislative acts that govern the HOAs and their building management practices create a situation, where:

- although it is one building that needs the money, and pays it back, it is the HOA that takes the credit, as it is the only entity with a separate bank account. (There are a few cases, mostly in Yerevan, where one HOA consists of one building.)
- the HOAs cannot offer a lien, and it is not possible to pledge their account as a collateral
- lending only becomes easy, when a building has an income generating asset – like a mobile transmitter – that provides the collateral
- in case of borrowing there are individual loan contracts offering the collateral, making borrowing both difficult and very risky for the individual owners

Changing these regulations is essential both for tackling energy efficiency and other crucial renovation works. Without these HOAs will be unable to get access to funding, and will be solely dependent on their connections to the local municipalities for financing the major interventions.

Challenge 5: The income level of the residents. According to the World Bank, Armenia belongs to the lower middle-income countries. Remittances play a crucial role in the economy, and the country has been hit very hard by the Russian economic crisis of the last years. This and the effects of the global financial crisis led to the rapid increase of poverty, estimated to reach more than 30% in general over the country, with the lowest rates being in Yerevan. (Arka, 2014) Given the costly nature of energy efficient investment into the buildings, a big challenge is provided by the generally low income level of the Armenian population. Residents of old multi-apartment buildings can usually be considered middle-income or lower, as people of wealth have often moved to newly constructed buildings or single family homes. Also, residents are relatively mixed with regard to their income in one building.

A further problem is presented by the very high and still increasing interest rates (mostly due to the unstable exchange rates) in the financial sector that puts bank loans often out of reach for the above mentioned target group. Currently reasonable and accessible loans can only be provided through the use of donor funds.

Given this background, one of the most important difficulties is to create a system of subsidies that is sustainable on the long-run, affordable and within reach for these very mixed, but relatively low-income residents and still useful in achieving valuable energy efficiency interventions that tend to be very costly.

Steps taken so far

These challenges have been noticed by the local stakeholders, and there have been steps taken in order to tackle them. Most importantly, Habitat (HfH) Armenia has been in negotiations with different actors, to overcome some of the problems presented. In the course of these negotiations challenges 3 and 4 have been tackled from different aspects.

- With regard to the inefficient operation of the HOAs, HfH Armenia has been working together with the Ministry of Urban Development *to modify the Law on Condominiums and the Law on Multi-Apartment Building Management*. Most importantly, the modifications planned will differentiate between the management and the maintenance works in the HOAs, hoping to

make them more inventive and less reluctant to tackle their physical problems, among them energy efficiency. In addition, the legal revision is expected to decrease the risks banks face when they enter the field of lending to condominiums. It is hoped that a by creating a clearer situation in legislative terms, the trust of both banks and residents can be boosted.

- In order to facilitate the lending process, HfH Armenia has working together with INECOBANK, and has been trying to develop a close cooperation with other banks as well. There have been negotiations with 6 banks since March 2015 - with Ameriabank, Acbabank, Armeconombank, Byblosbank, Procreditbank, Armswissbank - and HfH Armenia has managed to reach an agreement with Acbabank on developing a joint product. With the guarantee problems being one of the central obstacles, HfH Armenia is trying to find ways of creating a guarantee fund to facilitate the lending process.
- In order to improve residential involvement in the maintenance and refurbishment of multi-apartment buildings HfH Armenia has been running a project since 2013 with the aim of strengthening civic involvement in condominium management and improve the residents' self-organisation. Furthermore, starting from 2014 the AREEM project (Access to Renewable and Efficient Energy in Municipalities) implemented with EU funding in Vayk and Spitak has the aim of creating a transferable model for energy efficient renewal on altogether 46 buildings, which are residential with the exception of one. The model however will work with an 80% subsidy rate, which will make it hard to replicate under different circumstances.
- In the framework of the REELIH project model interventions have been carried out that not only galvanised the residents, but used funds from the Yerevan municipality that subsidized the interventions with 40%.

6.2 Recommendations for the energy efficient subsidy scheme

Based on the challenges listed above, it seems that before setting up an energy efficiency scheme, as a step 0, the problems of distrust and lack of transparency should be tackled in the HOAs. The current changes in the housing legislation partially aim for this but as the problems run deep – demonstrated by the very low collection rates in numerous HOAs and the generally low maintenance fees – incentivising individual buildings to function as communities could become an entry point to developing a successful scheme.

As an additional step, creating a sustainable and efficient nation-wide system of subsidies for the energy efficient renewal of the multi-apartment housing stock requires the precise understanding and definition of the following aspects of the program:

- target group
- possible financial/subsidy solutions
- (realistically) achievable goals
- time scale
- awareness raising

Target group

Although about half of the buildings are single family homes in Armenia, carrying out energy efficient interventions in multi-apartment buildings is more cost-efficient: such interventions affect more people thus can create more wide-spread results. The typical multi-apartment building in Armenia is between 30 and 50 years old, as the peak of housing production in Armenia was between 1960 and 1980,

although construction rate only dropped really sharply with the regime change – similarly to the majority of Socialist countries (Stepanyan and Varosyan, 2009).

People living in these apartments are of very different income levels, as it has been stressed by challenge 5. Typically however, spending on energy bills makes up a significant share of their budget, and heating makes up a particularly high share of that. A World Bank study from 2010 found that Armenian households on average use about 60 percent of their energy consumption for heating purposes, meaning that much of the energy budget of the households, particularly of the poor, is spent on heating during the cold winter months (Ersado, 2012). By insulating the buildings and investing into energy efficiency could improve this, however, given the cost of investment, most likely only on the long run.

Given the REELIH projects aims and aspiration, it would be natural to think that bearing in mind the exasperating circumstances of the poor in Armenia, the logical target group would be made up of the most vulnerable and the poorest households. Nevertheless, it has to be kept in mind that:

- Given the general income level in Armenia, even households of middle status have financial problems and spend a proportionally high share of their income on energy bills.
- Given the high cost of complex energy efficient interventions even middle-income families would encounter great difficulties if they had to finance these by themselves.
- Furthermore, as the energy costs are relatively low in international comparison, the rate of return would be exceptionally long for the families without support, discouraging them from initiating such a process. By targeting the subsidies only at the most vulnerable, any energy efficiency program would become inefficient and unable to yield actual result.
- Finally the residential areas with multi-apartment buildings are usually populated by mixed-income residents (with the exception of new, high-end constructions, mostly situated in the downtown area of Yerevan), thus selecting only low income groups for support would really make the selection of the buildings very difficult.

There are practical/administrative problems with targeting as well that that make it difficult to use it in the Armenian context:

- On the one hand developing a good income checking system is almost impossible in an environment with a high share of illegal incomes and the importance of remittances.
- On the other hand operating an individual targeting system is costly and time consuming. As the Romanian example shows the amount of paperwork involved can kill a program. Rather, based on the Lithuanian example, the targeting of additional subsidies should be made as simply as possible, by tying it to normative subsidies that reach a well-defined circle of residents in need of social assistance. (It is possible however, that residents receiving such subsidies will not be interested in participating due to the high costs.)

Thus, it is suggested to evade direct income targeting of the subsidies. On a national level it is rather advisable to 'waste' some subsidies on more well-off households in order to achieve results, and to engage enough number of households.

A suggested solution would be to direct the subsidies by choosing the appropriate building types: most importantly based on the construction technology and the year of construction. Some of the CEE countries, especially in the early periods, were using a relatively well-defined list of buildings, where the residents could make use of the subsidies.

Financial solutions

On a general level it has to be kept in mind that prices go up automatically with subsidy schemes due to a variety of reasons. There are administrative costs involved with applications - writing the tender, making an energy audit, controlling the results, etc. – that result in an automatic price increase. Furthermore, requirements are often stricter when it comes to subsidized programs, and higher standards also mean higher costs. Finally, experience also shows that entrepreneurs often begin to charge more when they work on a building that has won subsidies.

A successful financial scheme should be able to integrate the contribution of three sectors: that of the public sector, the banking sector – through loans – and the contribution of the owners – either in the form of savings or bank loans.

Public sector

Any successful energy efficiency program will require substantial financial contribution from the Armenian state or can be financed – partially – by a donor fund. However, based on the experience from the CEE countries and the field work in Armenia it seems that the subsidy level should be rather high – at least between 40-60% to start with. (Although Habitat Armenia counted with a 30% subsidy rate in its energy audits, the Romanian and the Hungarian cases suggest that in order to make the interventions feasible for a large share of the population the subsidy share should go higher). However, it should also be considered that high subsidy rates can distort the market mechanisms.

For the financial scheme to work well, there are several solutions. The following ideas can be followed both separately or together:

- to share the subsidy provision between different levels of public administration (national and municipal). This allows a better decentralisation of the program, raises the interest of local politicians and gives the opportunity to engage the local population better. The last point can be crucial at the initial phases, when there are no good practices available yet
- to increase/decrease the subsidy intensity according to the planned interventions – the level of which is to be decided based on the level preference for complexity
- to create a revolving fund in order to secure (at least partially) that there will be enough funding available on a long-term. However, the use of revolving funds, will also mean that financial institutions will play a crucial role, most likely raising the bar of income level for those participating in the programs
- to use a guarantee fund, diminishing the risk of the first participating institutions, thus enabling their entrance to the program

None of the solutions is fixed: everything can/should be changed as the program evolves. Often higher subsidy rates are required to jump start a programme, and they can/should be decreased as more buildings join. Finding a middle ground is the key: the CEE experience shows that only those programmes can be maintained on the long run, where the general subsidy level is kept at a relatively low level.

Banking sector

For a larger scale renovation buildings will have to take loans. In the current Armenian situation this is somewhat problematic due to a variety of reasons: banks still require individual collaterals, even if the loan is for the building. Furthermore, given the volatility of the Dram interest rates are both high and change rapidly. In the framework of a successful subsidy program these problems have to be solved, making the banks good and interested parties in financing.

With regard to the first one, current changes that point to the direction of each building having its own separate bank account is only the initial step. It would also be important to make the accumulation of a renovation fund compulsory – in case a building would like to obtain subsidy or loan with favourable conditions - placed on the separate account of the buildings. On the one hand this fund could provide the basis for any intervention, on the other hand with the changing financial regulations such funds could provide the collateral for the bank instead of individual mortgages. (This however, will only be possible if the collection rates become higher and the maintenance fees are raised as well.)

Solving the second set of problems would require subsidizing the loans, as long as the market in itself can't provide cheaper loans at relatively fixed interest rates. As the CEE experience shows it is possible to combine subsidized loans with grants – as the case is in Hungary. For stabilizing and somewhat lowering the interest rates that would make these loans accessible to the public, cheaper and more stable international donor funds could be used.

Residential sector

All the above recommended changes require a transformation of the general attitude of the residents: it can be summarized best by suggesting that residents will have to start seeing themselves as owners en masse. They have to control the HOA management, they have to pay their monthly maintenance fee and be willing to invest into the jointly owned part of their building. This behavioural change is a perquisite to all renovations, and also to realistically introduce a means tested, targeted subsidy scheme for households, who are unable to finance the own share of the renovations.

Goals to achieve

With regard to the realistically achievable goals, it can be stated that so far minor interventions have been carried out with the exception of the Vayk and Spitak programmes – that are also in preparatory phases - and major changes – like to complete roof repair – were financed by public bodies, like the Yerevan municipality. Based on the CEE experience, it is advisable to start with smaller scale projects, and introduce the complex ones later, the reason being that small scale projects are cheaper and easier to carry out – thus two great impediments, the lack of appropriate finances and the missing organisational practice can be minimised. The first program phase can be regarded a learning period for all actors, allowing for subsequent improvements and modifications.

Furthermore, as it has already been stressed under challenge 1, the structural problems are often of such magnitude in Armenia that they should take precedent over everything else. Based on these the modernisation of elevators, smaller insulations (like roofs), windows and entrance doors and general engineering problems should be tackled first. These, carried out on a large scale, would allow moderate energy gains and solving some of the most imminent structural problems for a large number of households. By combining structural and energy elements it can also be expected that owners will be interested.

Also, interventions with the aim of increasing the comfort level of the residents – like improving the outlook of staircases and repairing them – should be given consideration.

As mentioned already, it is possible to raise the subsidy level in case more interventions are carried out at the same time, thus giving incentives to residents to take on bigger scale interventions. This way a larger energy saving can be secured, however the perverse effect will be present that more likely buildings will make use of the extra funding where the residents are better off, thus are able to participate. This might be in contrast with the original aims of the REELIH project.

A particular feature of the Armenian case is its dismantled district heating system: this sets Armenia apart from the CEE experience, where the vast majority of the buildings operate with a district heating system, making the often costly modernisation of the heating system a high priority in the renovation and energy efficiency schemes. Given the breakdown of the district heating system and the fact that homes are heated individually, a special opportunity rises in Armenia, shortening the rate of investments into insulation due to the individual metering.

Importantly however, and this seems to be a crucial lesson learned from the experience of the CEE countries, as it has been mentioned already, at the end of the interventions households begin to regard the possible savings often as a secondary motivation. The growth of comfort level and nicer surroundings are just as important, and people are willing to engage in interventions even in cases when they have to pay more for a given period of time, as long as this period is foreseeable.

Finally, quality control belongs to a less studied part of the subsidy programs. However, if neglected – as the example of many CEE programmes shows – it can lead to very mediocre results with regard to energy efficiency. It has been shown that an initial energy audit coupled with a final supervision can yield the best results. The initial audit sets the achievable targets, based on which the plans are made, whereas the final supervision has to see if the plans have been realized appropriately. It is however hard to really check if the energy efficiency goals have been met properly.

Time scale

What foreseeability can mean might be very country specific and also depending on the economic development level and the institutional system. So far, small interventions in Armenia have operated with very short loan periods – the maximum of 3 years. While this gives security and foreseeability, it allows for very small scale interventions. It seems from the CEE experience that loan products with the return period of 8-10 years are the best: they allow larger interventions but also the time-span is still acceptable for many households. For real large-scale, complex interventions, with 40-50% energy savings however, the usual time span of loans could be longer.

Habitat Armenia estimates – based on energy audits – that it is feasible to have complex interventions with return periods of 7-9 years in case of a 30% subsidy rate. The audits were carried out in the framework of the REELIH project, and serve as a guiding principle. Theoretically, the time span seems to be within the accepted range, however given the condition of the Armenian financial system (very high interest rates, very careful banks and people unwilling to take risks) it is more likely that even 7-9 years might be too long. Given the difficulty of foreseeing such time spans under volatile economic conditions, there is the possibility to carry out large scale interventions by breaking them up into smaller, 4-5-year periods. (There are similar attempts in Hungary now.) Thus, each investment section, although building on the previous one, becomes a separate entity with separate loans and arrangements. (However in this case the technical planning must be very strict as some of the interventions should precede the others, and the perverse technical effects should be avoided.)

Awareness raising

Important legal modifications about the operation of the HOAs are on the way, with results to be seen in the early months of 2016. As it has been stressed in the previous parts of this paper, in order to start a subsidy scheme for energy efficient interventions into the multi-unit housing stock, the operation of the HOAS have to be made more transparent – mentioned as step 0 previously. Transparency is one of the key points that will allow residents to feel more in controls As part of this increased transparency individual buildings have to have a separate bank account, accessible for

resident representatives as well. The representatives of the individual buildings should have a more in-depth impact and control over the operation of the whole condominium. This move will result in taking away the security provided by the quasi cooperative like function of the HOAs, but will at the same time provide better control for the residents. Through this increased control it is expected that the trust will increase, leading to generally higher collection rates of the maintenance fees.

Increased control also necessitates more organised residents. Although there are building representatives elected, more interest from the residents is necessary to 'push' HOA managers to get involved. More interest can be helped by awareness raising programs both from the municipalities and from NGOs as well. However, one of the best ways to have residents involved is 'presenting' success stories. Both the interviews in Armenia and the experience from the CEE countries show that there is nothing as effective in organising residents as seeing buildings already completed or nearing completion in the neighbourhood.

Table 10: Summary of the actions to be taken regarding different decision making levels and actors affected

Actor	Actions to be taken
International organisations	Providing donor/guarantee funds to help to start the subsidy schemes Providing donor/guarantee funds to financial institutions in order to enable them issuing loans with lower interest rates
State level	Creating a subsidy program to initiate energy efficient interventions among the HOAs Changing the law on the management and maintenance of HOAs to make their operation more transparent
Local level	Making community work among the HOAs, trying to make sure that more and more buildings start some energy efficiency investments Providing partial subsidies to enable some structural and at the same time energy efficiency work to be carried out
Financial institutions	Providing joint loans with the help of donor funds at a stable interest rate Working out ways to work with individual buildings without the need of individual collaterals
Home Owners' Associations	Finding buildings within the HOAs that are willing to engage in energy efficient interventions Implement small scale interventions (renovation, common activities) that help building a community out of the HOA members
HfH and its partners	Partnership building with different levels of public administration Partnership building with banks Awareness raising and community organising campaigns for the HOAs and also for the individual buildings

7 RECOMMENDATIONS FOR BOSNIA & HERZEGOVINA

7.1 Definition of the problem/gaps

There are already signs of extensive renovation activities in few multi-unit buildings in Bosnia & Herzegovina implemented by means of residents' own funds or from donor resources. This happens despite all the difficulties that make the mainstreaming of energy efficient interventions extraordinary difficult. The following chapter names the most important ones.

Challenge 1: Economic and financial background

Bosnia & Herzegovina went through a significant economic growth in the 2000s (4-7% annual growth rate – World Bank) but was seriously hit by the financial crisis (resulting in 3% GDP decrease in 2008) and currently recovering quite slowly. The nominal GDP level of the country was 3 642 EUR/head in 2014 (Agency for Statistics of Bosnia & Herzegovina), which is about one third of that of the CEE countries. This GDP level is close to that of Romania in the beginning of 2000s when the first attempts to work out a subsidy scheme for energy efficient renovation of the multi-family housing stock were made (but the ideas were not implemented in practice that time).

The level of GDP makes an impediment to implement large scale renovations both from the side of the inhabitants and the public sector even though the average wage in Bosnia & Herzegovina is not extremely low (approximately 450 EUR/month in 2014, which is higher than can be expected based on the GDP level – rather similar to Romanian's average wage currently). However, the official unemployment rate is very high (44% in 2013-2014), alluding to serious income inequalities in the society. Even if officially unemployed people can obtain unofficial income in the grey economy, its level in general is lower than that of the official salaries and in addition to that can hardly be the basis for any kind of bank loan products. (That is why micro-finance institutions with substantially higher interest rates but limited requirements concerning the underwriting procedure are very common.) The extreme mixture of decently paid and poorly paid households in the same multi-family buildings may also cause tensions as the expectations and financial capacity cannot easily be aligned.

In addition to the unofficial incomes the share of remittances in the GDP is very high (estimated to be about 30% of the GDP). This is positive from an income point of view but makes any system which is based on income-testing unreliable.

The uncertainties concerning the income level of families are reflected in the low level of common fees that are paid to operate and maintain the multi-family buildings. A usual amount of common fee is between 0,1-0,2 EUR/m² - that includes operation, management and maintenance costs – which is about one fourth-one fifth of the Hungarian average with the same cost items. Even if the costs of materials and services are significantly lower in BiH than in Central Europe this difference is a lot less than the difference in the level of common fees, making any kind of investment in the common property very difficult.

The financial background of renovation of multi-family buildings is limited both from the subsidy and the commercial lending point of view. There is no stable and reliable subsidy scheme in operation - international donor funds finance only pilot projects and generic subsidy schemes are not worked out. (In the framework of the REELIH programme, Tuzla Canton provided 30,000 BAM for three municipalities, which is rather a symbolic amount.) However there is a hope that this trend will be broken as the council of Tuzla Canton accepted an Action Plan on energy efficient renovation of the

housing stock and dedicated about €0.5 million for supporting the renovation of the privately owned housing stock. (The exact use of this fund is under elaboration currently.)

Commercial lending is limited to loans to individuals including bank loans and loans from micro-finance institutions. The first type of loan is provided to clients with stable income (employees or pensioners) and offers credits on 7.24-10.71% effective interest rate. (Based on the inquiry of ENOVA 4 banks provide commercial loans from their own resources in FBiH for energy efficient purposes, and two banks operate as an intermediary of international funds. In the Republika Srpska 2 commercial banks provide loans for EE purposes based on international financial resources. The conditions of internationally provided loans are a bit more favourable than the domestic funds.) Microfinance institutions are also present in the housing market and provide loans for clients that would be ineligible for bank loans mainly because of their uncertain or unofficial income. (According to the analysis of ENOVA 8 micro-finance institutions provide EE loans in the FBiH and 3 are present in RS) The effective interest rate for such type of loans is from 19.6 to 37.84%. Meanwhile providing joint loans to the communities of multi-family buildings is not considered at all by neither the commercial banks nor by micro-finance institutions. The experience of the CEEs shows that the mortgage finance system should be strengthened first and then more complicated financial products are developed. In case of BiH the initial period of developing the basic products seems to pass away, so the time for product development has come.

Joint loan seems to be a minor issue in case individual loans for renovation purposes are available, however in practice this is the key for mainstreaming any subsidy program. It allows HOAs to handle the cases when not all (or nearly all) owners agree on financing the renovation procedure or are not able to obtain individual loans. Individual loans and consensual decision making processes can result in occasional and limited number of renovations projects while more simple decision making procedures with the combination of joint loans can result in systematic solution to the renovation needs.

Challenge 2: Incentives for energy efficiency interventions

According to the recent technical audit of 973 buildings in 12 municipalities of Tuzla canton implemented by ENOVA approximately 80% of the multi-family buildings do not meet the current energy standards. In order to reach these standards about 140 million KM investment would be needed (in case of 773 buildings), that would result in roughly 50% savings concerning the energy used for heating. (Savings in cooling costs were not considered so far.) Taking into account of the current wood, coal, gas and electricity prices for one kWh the pay-off period of such a complex intervention is calculated to be between 15-40 years. (In case of individually heated buildings the return period was between 15-19 years, while between 19-40 years in case of district heated units, as about 50% of the heating bills relates to the fix costs in case of district heating, thus the energy saving can be reflected only in the variable part.) The length of the pay-off period is determined by the fact that energy price (energy used in multi-family buildings) is subsidized and is usually lower than the market price. (Except for natural gas, however it only has a marginal share in energy supply.) In addition it has to be noted that about half of the housing units in multi-family buildings are individually heated in Bosnia, which means that not all the rooms are heated, thus it is simpler and cost efficient for people living in poverty to heat only part of the dwellings than to invest in energy efficient interventions. While in district heated dwellings the consumption is not metered in the vast majority of the buildings (several hundreds of buildings in Sarajevo are exceptions), which means that even if there is a saving potential it cannot be materialised as far as new meters are not installed (fortunately the district heating system is mostly set that way that the heat to individual buildings can be regulated, thus “only” metering can be solved).

On the other hand the Central European experience show that financial saving is an important key word to encourage owners to implement energy efficiency measures, but it is far not the only (and not necessarily the most important) word. People tend to pay more for several years for the instalment of the bank loans that were taken for implementing energy efficient interventions than they save on the energy. Importantly, they very rarely make exact calculations about gains and losses.

The few buildings that have been completed by the REELIH project also strengthen the assumption that people do not count precisely and do not rely on energy savings only: rather they either would like to solve fundamental technical problems (like leaking roofs) or intend to increase the comfort level by increasing in-door temperature and stop moulding. On the other hand it is important to take into consideration that the clients of REELIH project do not necessarily represent all the home owners in BiH.

Concerning the incentives from an institutional point of view we have to note that despite the fact that the Directive 2006/32/EC on Energy End Use Efficiency and Energy Services makes it obligatory to prepare and adopt a National Energy Efficiency Action Plan (NEEAP) the Federation still has delinquencies with regard to that. NEEAP was prepared (supported by USAID in 2011-2012) but never adopted. According to the proposal 6,2% energy efficiency increase was suggested in the residential sector from 2011 to 2018. However it seems that in reality energy efficiency is easier to implement in the form of Energy Service Contracts based on alternative energy sources and implemented in the commercial and industrial sector (because of more capital and simpler decision making system) that is why without institutionalised incentives these sectors will lure the attention of the market investors more than the residential one.

Challenge 3: Legal - organisational background

One of the biggest impediments of implementing any kind of renovation activity in case of multi-unit buildings is in connection with the legal background. There are differences concerning the legal background in the Federation and in the Republika Srbska. HOA is not a legal entity in FBiH, however it is in the RS. The exact legal background is created on cantonal level, thus there can be slight differences between them, however the overarching framework is set on FBiH level by the Law on Proprietary Rights. The most important regulation in Tuzla Canton for example is the law on the management and maintenance of residential properties that have several owners. This law defines what the individual and common parts are, how the residents should create an internal regulation between themselves, how the “condominium” can enter into management contracts, how the decisions are taken. Based on this law the HOAs should have quite a large room for manoeuvre, however in practice there are serious impediments, two of which should be highlighted here:

- A consensus is needed with the agreement of all owners on the renovation in case the intention is to involve all the owners into the financing. The decision can be taken with less than a 100% vote but this case the financing obligations should be shared among those ones that voted for an intervention. Thus this law avoids putting financial burden onto the minority in case “only” a majority votes for the renovation. This main principle of democracy – precisely that the majority (or vast majority with a 2/3 vote) can enforce obligations to the minority - is questioned here and still seems to be an important issue which politicians feel too sensitive to put into the agenda.
- Even if the HOA is able to enter into contracts under its own name financial institutions still think that it is much simpler for them to approach HOAs throughout the companies that manage them. The law makes it obligatory for all HOAs to contract a management company for the operation and management of the building in the Federation, so HOAs are represented

by the management company and not by themselves. The accounts of HOAs are sub-accounts of their managers, thus they cannot act alone, cannot take loans and are tied to their management companies very strongly. The obligation to contract a management company creates complication in towns and municipalities where there are no or very few management companies available. (Theoretically it is possible to hire a company from neighbouring cities, but practically it creates a problem.) In many municipalities the market of management companies is not competitive at all, the only choice which is available is the formerly municipally owned company which tends to have a less market oriented, quality-service based behaviour. As a result, dissatisfaction with the management companies is high.

Besides the problems with the legal background the sense of ownership is still missing in many HOAs. While the windows of individual flats are changed in many cases, while the flats are renovated, while people invest in developed individual heating systems, the common spaces (façade, staircases, roofs, basement, engineering) remain neglected. Sense of ownership concerning the common spaces is not easy to develop, especially in buildings where the owners come from different social and financial background, often as a result of migration from other parts of the country. 20 years after the privatisation in most Central European countries it is still a problem, however also the CEE examples show that renovation is an action that accelerates the creation of a kind of community and strengthens the feeling of ownership.

In spite of these difficulties there are HOAs where the building (staircase) is in a very good shape, even added insulation layers can be seen. These cases show that despite the limited possibilities to choose a proper management company, and the lack of technical and financial experience, and the shortage of financial sources occasional renovation is possible. Experience shows that with the same amount of common fee the quality of management and maintenance can be very different due to the different level of devotedness of the owners and/or the managers. However we have to note that under the current circumstances there are possibilities for renovation only for the extraordinarily well organised or well financed communities but not for the average HOA.

7.2 Achievements and advantages

As it was mentioned before there are already signs that the owners are eager to invest in their properties. As an example, many windows have been changed in multi-unit buildings (due to the fact that the former windows became nearly non-functioning and there were relatively cheap solutions for the replacement with a better but not very high level insulation potential – with an approximate 2,8 U value). There are also occasional examples of staircase insulation or other extensive type of renovation. There were also pilot projects implemented donated by international organisations (like USAID, UNDP, EBRD, World Bank) but they rather concentrated on awareness raising and the improvement of the legislative background besides financing projects in the field of co-generation or the renovation of public buildings. There were also occasional local subsidy schemes set up in the framework of the REELIH project and it proved to lure the attention of the HOAs and also that of the municipalities.

There are also relatively developed individual financing mechanisms available, including banks in case of officially credible individuals and micro-finance institutions in case of non-credible ones. (A recent representative survey of ENOVA focusing on more than 1200 households living in multi-family buildings shows that 37,6 of the interviewed persons have taken already a loan from financial institutions, 10% of them for housing purposes (which means that being indebted is not an unusual phenomena for most of the owners).

The institutional set up for providing housing loans already exists in the sense that several international banks already set up their branches in the country and also the inflation rate is very low thus the interest rate level is moderate (approximately 7-10% annual rate in case of bank loans and 17-30% in case of micro-finance institutions).

The construction industry is also able to provide proper background for the renovations: insulation materials are manufactured in BiH and there is expertise also obtained in Western European markets.

The municipalities seem to show attention to the energy efficiency topic as 17 municipalities already have signed the Covenant of Mayors and prepared Sustainable Energy Action Plans (the cities are[18]: Banja Luka, Bihač, Bijeljina, Bosanski Petrovac, Čajniče, Gradiška, Kakanj, Laktaši, Livno, Prijedor, Sarajevo, Travnik, Trebinje, Tuzla, Zenica, Zvornik, Živinice - representing 1/3 of the complete population of BiH.

In addition to that, as it was already mentioned few times, an Action Plan on the energy efficient interventions in the residential sector was approved by the Council of Tuzla Canton in September 2016 (based on the work elaborated by ENOVA), and approximately €0.5 million was set aside for this purpose, which may open up new paths to elaborate energy efficient interventions.

7.3 Recommendations on legal, organisational and financial schemes

There is the underlying assumption that there might be a threshold of economic development and a certain GDP level that has to be reached in order to finance a large scale program of energy efficiency interventions. In case of the Central European countries even with generous subsidy schemes EE renovations only became popular (around 2004-2005) when the GDP level reached 5400-8300 eur/head. We accept the fact that energy efficiency is a much more important topic worldwide than it was in the beginning of the 2000s. There are also more serious obligations tied to it and the awareness among the residents is also higher (energy efficiency became a fancy phrase), but still there seems to be other needs of the citizens that must be met at first.

In order to improve the current situation in the field of residential energy efficient interventions there are steps to be taken that can be categorized as 3 different stages, taking into account the legal and institutional options:

7.3.1 Basic level intervention without significant modification of the current framework

In the short run if we assume that no significant change in the current institutional and financial setting is possible it is advisable to concentrate on the potential that is already available. It is visible that there are communities (mostly small and middle sized ones) that are able to implement larger scale renovations. The key in these communities is the organisational capacity. That is why these activities can be accelerated by concentrating on the management companies. Providing information and training to management companies that are already proved to be successful in activating the residents can be a step forward. Also it must be recognised that by the time the management companies are badly paid and cannot charge extra costs for the organisation of the renovation process, they might not be interested in leading it.

[18] The information was presented by Semin Petrović in November 2015 in Varese, in a workshop on 'High Level Workshop on Effective Energy Efficiency Policies, New Financing Instruments, and ESCOs'

Those communities can be more successfully convinced to implement EE interventions that have individual heating systems and a relatively bad physical state of the building. The marginal gain of implementing larger scale renovation is bigger in these buildings as 100% energy saving is tangible at once (while there is a 50% fixed fee in district heated units that cannot be basis for cost savings) and the physical improvement of the building can result in immediate increase of the comfort level. However it is important to note that individual heating is responsible for a significant share of air pollution by burning wood and coal, and the energy efficient interventions should focus on the change of heating devices into much more efficient and much less polluting ones.

Cooperation between banks and management companies should be built for this purpose. As HOAs can only have a sub-account of the management company, the companies have to get the loan for the buildings. This is a typical third party financing scheme. However it is most probable that there are limitations to acquiring loans for the buildings throughout the management company as the collateral should be provided by the company and the credibility of the company will be evaluated not the financial state of the building. On the other hand it is possible to create an innovative credit line for such special cases in which not only the liabilities of the management company create the collateral but the sub-account of the HOA as well –this way the cash flow of the community can be part of the collateral system which is the most commonly used collateral in the CEE countries where HOAs are legal entities.

By this mean the more financially stable and more reliable communities may get financing throughout their management company (which may gain a longer term contract in return). This is however far not the best solution as it makes the HOAs dependent on their management company. Still there can be model contracts to be developed in order to strengthen the mutual interests of the parties.

7.3.2 Introducing subsidy schemes without any significant institutional and legal change

The intense renovation of the multi-unit stock has started with the introduction of different subsidy schemes in the CEE countries. It is not easy to define the proper subsidy content taking into account that too high level subsidies lead to budgetary difficulties of the public actors and also serious distortion on the construction market, while too low subsidy levels may lead to low intensity of renovation activities privileging the wealthiest HOAs. On the other hand we also experienced that subsidies with lower aid intensity were able to operate when coupled with a proper bank loan system (which provided joint loans for the own share), but the lack of proper bank financing leads automatically to subsidy schemes with high aid intensity (e.g. in Romania). In addition subsidies tied to refundable sources (e.g. interest free loans with or without combined grants, like bonuses) require highly developed bank financing mechanisms with the possibility to get joint loans, which, as was already emphasized several times, is not a possibility in BiH by now.

What was also found is that subsidy rate tends to be higher in the introductory phase of the schemes while lowered somewhat by time. Taking all these into account and considering the fact that joint loans are not available in the BiH market an aid intensity of 40-60% seems to be reasonable. If the subsidy schemes became mainstream and result in financial difficulties for the public sector than involvement of other financial sources can be considered: 1) like revenues coming from quota trading (in case BiH introduces the Environmental Trading System) 2) EU funds available for the accession countries (this purpose can be negotiated with the EU).

In the first period of the instalment of the subsidy scheme the technical requirements should be flexible as it is possible to achieve energy savings in many different ways and it would be avoidable to require too expensive interventions. (It seemed to be a mistake in Romania to introduce a subsidy scheme

with 66% subsidy rate while requiring too high standards for the interventions. This combination resulted in the failure of the subsidy scheme in spite of its relatively high subsidy content.)

Based on the technical audits ENOVA carried out in Tuzla canton it seems that insulating the facade is the most cost effective intervention in majority of the buildings thus suggestions towards this interventions should be formulated. In the CEE countries it is observable, that by time the subsidy schemes became more sophisticated and 1) the subsidies partly became refundable – e.g. interest rate subsidies - while 2) the more complex the intervention was the higher subsidy rate could be achieved. In addition to that it is easy to understand that some of the interventions have more positive externality towards the public while others result in more individual benefits (e.g. in case an individually heated building connects to district heating than the effect in reducing air pollution is high while the individual benefits are lower). These differences may also be taken into account in defining the proper subsidy level. In spite of these possibilities we do not recommend to start a subsidy scheme with such sophistications in the introductory phase, in the contrary it is advisable to start with a relatively simple subsidy scheme and then measure the results and impacts before making it complex in the beginning.

Taking into account the fragmented nature of BiH administration (two Entities+Brcko District, 10 Cantons in the Federation, municipalities and cities) it is a possibility to turn this phenomenon into an advantage and create a subsidy chain in which all entities provide some part of the financing and by this mean the financial burden is dispersed not endangering any of the budgets of the actors. Meanwhile it is important to keep it simple from an operation point of view. Multiplied financing must not result in multiplied administration. One of the actors (like the municipalities) should be named as the 'owners' of the subsidy scheme being the ones that evaluate the applications. In case this actor approves the application and decides to provide its share than the next chain should automatically support it up to the support quota this municipality has on Cantonal level. (This quota can be calculated e.g. based on the number of targeted housing units that can be found in the territory of the municipalities.)

It is a major question whether this subsidy should be generic or targeted in any sense. It is known that the composition of owners in most multi-family buildings is mixed containing households with different income level. Theoretically it would be advisable to introduce a subsidy scheme with individual targeting providing higher subsidy rate for the families with lower income. However we have to be aware that operating an individually targeted subsidy scheme has very high transaction costs as it requires the evaluation of individual incomes. In a country with such high level of unofficial incomes, remittances and in general with relatively low incomes in average, individually targeted subsidy schemes would cost more than it would bring benefits. Opposite to individual targeting it would be important to decide whether the subsidy schemes intend to focus on any particular segment of the multi-unit housing stock. (Like buildings built before a certain date or buildings located in less advantageous neighbourhoods.) We suggest not making this focus too narrow as the visual pattern of successful renovations will have the greatest accelerating effect on other buildings/communities. That type of housing should be chosen as a focus where a lot of residents are located, the energy parameters of which are bad enough – resulting in significant and not marginal improvement in physical conditions – and where the residents represent rather a typical middle class than a better off layer of the society.

Besides providing subsidies the local municipalities might have important role in providing technical audits, assisting the organisation of the renovation (at least to train the representatives of the owners and the management companies). They can implement this task directly throughout their administration (as it is currently applied in Romania) or throughout civil or even for-profit organisations. This role is highly important in the initial phase of the programme when the home owners' associations

are less experienced and do not have the chance to learn from each-other. In a later phase of the programme the municipality (or more precisely the local level) can facilitate the knowledge sharing by organising workshops or club events for the representatives of the HOAs.

Without a proper bank financing background, even with a carefully developed subsidy scheme, mostly smaller communities will be able to join the programme. A 40-60% subsidy rate would require 60-40% own share which – in case of a significant EE renovation – is most probable not available at the bank account of the HOAs (in practice at the account of the management company). Thus extra contribution is needed from the owners which would require cash-payments or individual loans. A close community is more able to allocate this fund and convince all (or nearly all) the owners to contribute to the own share while in a bigger community it happens rather rarely.

In bigger communities there is a need for less individualised but more standardised solutions. By the time banks do not issue joint loans due to legal restrictions and market consideration one of the options can be third party financing, when a third actor provides the funds and/or implements the renovation. This is a typical ESCO solution taking into account that only the future energy saving can be the 'collateral' for the financing. Gas companies, district heating companies are in the position to provide financing and be able to meter/control the consumption and fit it into their billing schemes. Theoretically these companies can obtain a long term (e.g. 20-25 years) loan (or any financial institutions may buy in equities in a project like that) to finance the renovation and either directly or with the involvement of intermediaries (e.g. other ESCOs and/or construction companies) they can implement the renovation while the heating bill remains the same or changes according to a pre-defined scheme. This is theoretically a possible solution however it has several deficiencies, which needs to be carefully investigated before an investment decision is taken:

- About half of the multi-unit stock is not district heated but heated by wood, coal or – in rare cases – by gas. This case there is no one entity that provides the heating energy and collects the cost of it. This case – as was suggested by ENOVA and approved in the Action Plan of Tuzla Canton– the buildings should be connected to district heating first which would require additional investments. (Not only the new district heating networks and facilities would require additional funds but the fact that the heat should be regulated by flats as currently families can influence their consumption in individually heated units quite easily and most probable they would not give up this opportunity and change to district heating without the possibility of individual regulation.) The connection should be financially feasible which means that the additional costs of connection should be covered by a much more efficient energy source than the current one. ENOVA estimates that using the waste energy of a biomass energy power plant would result in much more efficient production of heat than the current one (they estimate that the current individual heating systems' burning efficiency is about 80-100% lower than that of large boiler ones). If the increase of efficiency compensate the additional investment costs and the residents are willing to change from individual heating to district heating than the starting position of individually heated and district heated buildings can be nearly the same. (In addition if the application of co-generation technology in case of the already existing district heating systems is also feasible, than the upgrading of the already run-down heat source systems is also advisable. However it should be noted that the amount of purchased co-generated energy should be specified based on the long term needs of the DH system – e.g. if there will be significant decrease of purchased energy because of the EE renovations than smaller amounts should be fixed in a long term contract.)
- Under normal conditions not only energy saving is the factor that makes an EE intervention profitable for the owner but the increase in comfort level and increase in the real estate value also count. These are all part of individual financial models that help to decrease the

theoretical pay-off period. For a utility/district heating company only the saving is the factor that creates the coverage for the interventions thus the pay off period is lengthened.

- The predicted energy saving and the real energy saving may differ from each other significantly as the behavioural aspects may overwrite the technical aspects. In an ESCO contract the utility company can rely on only the minimum savings that can be predicted, which can further prolong the pay off period (which is already predicted by ENOVA as 20-40 years in case of district heated buildings if insulation of facades, roof, basement and the change of windows is implemented – without calculating with engineering and regulation/metering costs).
- The residential ESCO contracts are typically short term ones or at least do not exceed 10 years, because the longer the period the more numerous the uncertainties are, which naturally increases the price. (ESCO residential schemes in Europe, regarding the privately owned housing sector typically concentrate on renewables or the replacement of boilers, but hardly cover complex renovation interventions.) On the long run (20-25 years) the price of utility can change (even in case of domestic coal the climate regulations can influence the price significantly) and the technology can change. The long term ESCO contracts are regularly reviewed in practice which is not easy to do in case there are thousands of individuals as contracting parties and the position of the utility/district heating company can also change in such a long run. However in case of district heating systems based on new co-generated waste heat the price of energy can be somewhat fixed or at least predicted for 15-20 years which may provide a kind of price security. The question is which entity will provide the additional funding to decrease the pay of period of EE interventions from 20-40 to 15-20 years. The other solution would be (which ENOVA proposed and was also incorporated into the Action Plan of Tuzla canton) to fix the district heating prices by the authorities for a long period of time (this system would be similar to that of the fixed feed-in tariffs which are applied all over Europe in case of installing renewable energy sources).
- In the ESCO scheme the cost of investment is mostly paid by the gains thanks to energy savings. However it is based on the prediction that the residents constantly pay their heating bills. The financial model is very sensitive to non-payment which is a crucial issue in the district heating system currently. In case a certain rate of predicted arrears is built in the financial model it will further increase the average monthly costs or the pay off period.
- It is also questionable why a utility/district heating company would spend time, money and energy to enter into such a risky scheme in case it already has a monopoly on the market and is able to sell its products. Real market competition would rather result in such development decisions.
- It is also a question whether any bank would provide a long term loan for such purposes, whether this idea would go through a risk assessment procedure. (In such a case when most of the district heating companies produce loss and are on the edge of bankruptcy.) In addition a bank would require at least 30% down-payment and the DH companies do hardly have such reserves to finance large scale interventions. (The involvement of an investor for equity however may provide solution for this problem.)

In any case it seems to be rather a political than an economic decision if a utility/district heating company would go into such a scheme on a large scale. It would also be a political question whether public actors create favourable economic environment (by fixed tariffs and subsidies) for any domestic or foreign companies to enter into the ESCO market and implement complex interventions. It did not happen in any countries of Europe, thus BiH would be the greatest pilot for such an approach.

7.3.3 Changing the legal background

The legal background is different in RS and in FBiH. In RS the HOAs are legal entities which means that it may have more room for introducing EE schemes by working intensively with municipalities, management companies and banks. (In addition any successful pattern in RS would help much more for FBiH to introduce new schemes than any other CEE countries in the region.)

Even if the change of the legal background in FBiH cantons may require time, this is the only way to result in sustainable solutions. Even if the two strategies mentioned before are applied on the short term the preparation for the adjustment of the legislation must be kept on the agenda.

There is a need to create (or improve the current one) a clear and detailed enough law on Home Owner's Association (that operate practically as condominiums). This law should make the HOAs legal bodies that are responsible for their decision and make them able to have bank accounts on their own name (in order to have a track record which is the basis for any kind of credit line). This law should make the HOAs bodies that can sue the owners being in arrears in the court (of course with the assistance of a legal firm or the management company). HOAs should be independent from the management companies, and should have the right to choose the best management company that is available on the market. In addition to that consensus based decision making on renovation must be eased substantially.

If the condominiums can be self-sustaining, independent organisations, than they can decide what risk they take for the renovation of the buildings. They might decide on taking a longer term loan (8-10 years) and implement a more complex renovation or they execute it step by step in stages. Of course the district heating companies or the management companies may provide them with offers on technical or organisational services, but concerning the financial offer, the banks are the entities that should prepare appropriate products. So far the banks do not consider at all providing joint loans, because HOAs even if they would like to are not able to get HOA based loan. That is why legal changes are needed to start the process – however future experiences with financing management companies as intermediaries for the renovation of HOAs would help to close the mind gap banks have towards HOAs.

In order to encourage this financial market to be developed the assistance of international organisations would be welcomed. As far as the banks are not convinced about the nature of condominium financing organisations like International Finance Corporation (IFC) can provide guarantee for the loans as it did in Hungary. The banks need some years to follow the cash-flow of the HOAs and believe that they are the best debtors available. (As the owners automatically pay the share of the non-paying residents in case a certain arrear rate is calculated in the common fee.)

If the HOAs became less dependent on their management companies it also creates the need to strengthen the community and strengthen the ability of the representatives to activate the community. This would require a set of minimum requirements concerning the operation of the communities to be clarified in the adjusted law (e.g. at least one/two annual general assembly meeting, a minimum level for the renovation fund, a proper accounting and reporting system towards the owners, decisions on large scale renovation with a simple – or with a two third – majority that forces all the owners to contribute financially).

The change of the legal background should encourage (enforce) the energy provision companies to make the buildings individually metered and the payment should be based on consumption. Naturally this would require investments and may also cause technical problems (e.g. in case of energy efficient intervention the energy consumption of a building can reduce that makes the operation of buildings connected in series of the district heated systems less efficient. However, according to ENOVA, it

seems that this technical barrier is less prevalent in BiH). All these questions (buildings to be metered and larger systems to be efficient) requires a strategy from the local authorities that should encourage financially and by legal means the optimization of the local heating systems.

As a conclusion the next table summarises the set of recommendations targeted to different actors in different time scale. However we have to note that most of these actors would not start encouraging the EE process regarding residential buildings without the assistance of different organisations. Currently Habitat International and its local partners are facilitating the process and this table intends to provide a structured approach of the issues that can be elaborated further on in the coming years.

Table 11: Summary of the actions to be taken regarding different decision making levels and actors affected

Actor	Actions to be taken	
	Short run	**Long run**
International organisations	Providing funding for further inquiry of possible EE solutions (like feasibility study of subsidy schemes, feasibility study of ESCO solutions).	Financial assistance to feasible EE schemes (e.g. in the form of guarantees, funds to co-finance subsidies)
State level		Entering the Environmental Trading System (Kyoto quota trading) Negotiating with the EU to provide co-financing for residential EE schemes in eth framework of the accession process.
Entity level	Co-financing local EE subsidy schemes	Modification of the Law on Proprietary rights in FBiH. (in order to make the HOAs legal entities)
Cantonal level (in FBiH)	Co-financing local EE subsidy schemes Analysis of the feasibility of ESCO schemes with all its costs and benefits	Modification of the Law on Use, Management and Maintenance of Common Parts and Devices of a Building (Tuzla Canton) – and modification of similar regulations in other cantons.
Local level	Introduction of subsidy schemes for residential energy efficiency purposes (local level being the 'owner' of the programme) - piloting phase Facilitation, training for HOAs and MCs Providing technical audits to buildings (Romanian model)	Sophisticating and mainstreaming subsidy schemes Creating network of HOAs to share experiences
Financial institutions	Developing joint loan schemes in RS New loan schemes with new collateral system to MC to assist the renovation of the buildings	Developing joint loan schemes in FBiH
Management companies	Implementing pilot projects (by means of loans to HOAs) Take part in trainings	
DH companies	Working out feasible ESCO based solutions Installing meters to individual buildings	Implementing ESCO based renovation schemes (if it proves to be feasible)
Home Owners' Associations	Looking for innovative MCs to implement renovation schemes (and encourage them with extra payment)	Under the new legal framework take responsibility for the renovation measures

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