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In-Depth Report on the Financing Sources for Activities Aimed at Energy Efficiency in Buildings and Fuel Poverty

December 2013

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Content

1. Introduction.....	3
2. Good practices for financing the energy efficiency of buildings	5
3. Potential Financing Sources for Improving the Energy Efficiency of Buildings	14
4. Addressing financing energy efficiency in households suffering from fuel poverty	18
4.1. <i>Evaluating the amount of funds necessary for the 2014-2020 period.....</i>	<i>20</i>
4.2. <i>Possible programs/financing schemes for addressing fuel poverty.....</i>	<i>23</i>
5. Conclusions and recommendations	25

1. Introduction

This report is part of the project “Improving Energy Efficiency Financing in Low income Households and Communities” under the United Nations Development Program (UNDP) with financing from the Global Environmental Fund (GEF).

This report integrates the result of previous analyses pursued within this project regarding financing sources and innovative financial instruments for energy efficiency measures for buildings, integrating specific requirements for low income households and communities, as mentioned in the TOR in the „energy efficiency financing” section of the UNDP-GEF project.

Directive 2010/31/UE regarding the energy performance of buildings (EPBD) and Directive 2012/27/UE regarding energy efficiency (EED) are the most important European community laws establishing the technical and, respectively, the long-term planning requirements on mobilizing funding for energy efficiency of the national building stock (public and private buildings, residential and commercial) aimed at reaching the objectives set by the Europe 2020 Strategy and, implicitly, of the energy-climate change package and, not least of all, in terms of reaching the larger objectives of the “Roadmap for moving to a low-carbon economy in 2050” by the European Commission, as well as of the UN Convention on Climate Change or the larger objectives of ensuring sustainable development, ensuring the preservation of the planet’s resources for future generations.

One of the requirements of Directive 2012/27/UE regarding energy efficiency regards the long term planning of the thermic rehabilitation of the public and private, residential and commercial building stock. Also, the directive sets the obligation to include in programs and planning the energy efficiency measures for households suffering from fuel poverty or social housing.

The directive offers member states the possibility of choosing among the implementation options it sets forth, meaning: the obligations scheme for providers/distributors of energy which would invest in the energy savings made by final consumers, policy measures or a national fund for energy efficiency. The condition was that any choice made would have to present proof of reaching the national target for energy savings according to the arrangement resulted from the common EU 27 target of 20% by 2020.

The studies performed at the European level have shown that the building sector covered approximately 40% of the final energy consumption at the European level and is responsible for nearly 36% of the greenhouse gas (GHG) emissions, making it the second sector in terms of potential energy savings and reduction of GHG emissions¹.

¹ Financial support for energy efficiency in buildings, COM(2013) 225 final

This report suggests alternatives for structuring sources and financing schemes depending on the possible options for implementing Directive 2012/27/UE, considering that so far no decision has been formally made on the topic.

Recommendations will be reviewed, on a case by case basis, depending on the comments and proposals resulting from debates in the Inter-organizational Workgroup (GLIO) taking place on December 17 of this year.

2. Good practices for financing the energy efficiency of buildings

Although improving the energy efficiency of buildings means making significant investments, the European Commission underlined the side benefits of the measures taken for fulfilling this objective, among which are: creating workplaces, reducing poverty, improving health and a higher level of energy security and industrial competitiveness².

According to the “Roadmap for moving to a low-carbon economy in 2050” by the European Commission, the necessary financial effort of the EU estimated for fulfilling the objectives regarding energy efficiency in the next decade was of approximately 200bn Euro. In the same document, it is mentioned that not meeting the objectives would be far more expensive (up to 78bn Euro annually in 2020), due to the evolution of the prices of fossil fuels and the increase of the degree of dependence on imports in the EU.

For the next financial exercise, 2014-2020, one of the EU priorities is the Fourth Thematic Objective: “Supporting the transition to an economy with low CO₂ emissions in all sectors,” within which energy efficiency and investments in renewable energy sources for public infrastructure and residential buildings are meant to be promoted.

Compared to the current period, the value of funds dedicated to this domain will reach approximately 17bn Euro³. This increased allocation is an opportunity for member states to develop new policies and to implement new financial mechanisms which would contribute to improving energy efficiency and an economic recovery, reducing, at the same time, the financial pressure on national and local budgets as well as on the family budgets of those affected by the rise in energy prices.

The majority of European countries choose the most amenable mechanism, subventions, through programs financed through the state budgets together with resources received from the European Fund for Regional Development (ERDF). Some examples are presented below.

Green Deal – United Kingdom of Great Britain and Northern Ireland

The Green Deal is an initiative of the United Kingdom, aimed at helping business and residential building owners to integrate more ecofriendly technologies on their properties.

² Financial support for energy efficiency in buildings, COM(2013) 225 final

³ Cohesion Policy support for Energy Efficiency Investments, 2012, Maud SKÄRINGER European Commission Directorate-General for Regional and Urban Policy

Installing new elements bears no investment costs and is paid through the energy bill during a period of time.

“The Golden Rule” of the Green Deal is that the expected financial savings need to be of at least equal value to the energy bill.

For house owners, there is a limit of 10 000 £ of the total cost of improvements, which may include:

- The thermal insulation of walls;
- The insulation of ceilings;
- Installing double windows;
- Improving doors;
- Installing smart meters.

Each property is inspected by a Green Deal consultant in order to evaluate which of the proposed measures yield the highest results. The work is performed by contractors accredited by the Green Deal.

The Fund for Environmental Protection and Energy Efficiency – Croatia

The fund was established in 2003 as a non-budgetary institution. Financing is ensured through environmental taxes and is allocated to physical and legal persons through credits, subventions and financial aid thusly:

- Credits – with a 0% interest rate, a 7 year repayment period (2 year grace period and 5 year repayment period), of up to 190 000 Euro ;
- Subventions – of up to 2% from the foreseen rate and 108 000 Euro;
- Financial aid – only for self-governed local and regional units, up to 190 000 Euro;
- Grants – for educational, research and development activities, up to 22 000 Euro.

These resources are allotted following a public call for allocation applications. The resources may be allotted to regional and local public administrations as well as physical and legal persons.

The users of the financial support for the Fund must however invest their own financial resources for the proposed project. The fund can cover up to 40% of the costs of the total investment.

For the public administration units in the areas with special interest for the state, the percentage can be pushed to 80%, and for the underdeveloped areas (islands, mountainous or rural regions with average personal income of less than 65% of the average income in Croatia), up to 60%.

The main activities covered by the fund are concerned with financing the preparation, development and implementation of some programs, projects and activities in the areas of:

- Protecting the environment;
- Managing waste;
- Energy efficiency and using renewable energy.

The fund also has the attributes of an Agency for Energy Efficiency and functions as an intermediary organism for energy projects financed by structural funds.

The financial resources of the fund are ensured through:

- Taxes on environment polluters (taxes on the emission of CO₂, SO₂ and NO₂);
- Taxes on releasing waste into the environment (dangerous and non-dangerous as well as industrial waste, special categories of waste, such as: packaging, old tires, electrical equipment, oils, old vehicles, batteries, chargers);
- A special environmental tax on motor vehicles.

Thermal Rehabilitation 2013 – Austria

For the year 2013, Austria mobilized 130 mil Euro for grants in the area of the thermal rehabilitation of buildings, among which 70 mil Euro will be allotted to private residences with building permits emitted before January 1st 1993.

The funds cover:

- Up to 20% of the eligible costs;
- A maximum of 5000 Euro for thermal rehabilitation;
- A maximum of 2000 Euro for the conversion of heating systems;
- For using insulating materials produced from renewable resources with an eco-label or wooden framed windows, there is a bonus of 500 Euros.

The target users are:

- (co)owners or administrators of single or two family homes;
- Owners or administrators of apartments in multilevel buildings.

Each applicant receives a single grant and each house/apartment can be used in an application only once.

The project components eligible for financing are:

- Insulating external walls;
- Insulating floors and roofs;
- Repairing or replacing windows and external doors;

- Converting heating systems (integrating solar systems, moving to equipment which uses wood, installing heating pumps).

Eligible expenses include material costs, installations and necessary authorizations (including the energy performance certificate).

Regional Support Instruments – Austria

Developing legislation in the area of energy efficiency and using renewable energy sources for residential buildings is the responsibility of regional authorities. Regional investment stimuli for the private residential sector are from a financial as well as an efficiency perspective the most important support instrument in Austria.

Regional governments are based on a combination of subsidy schemes (grants, etc...) which, in some cases are part of packages for constructing new buildings and the thermal rehabilitation of existing buildings.

Regional also have at their disposal substantial subsidies for supporting the construction of a central biomass co-generation plants used for district heating (DHS).

The Austrian agency for energy offers a database and an extensive search engine to all interested parties (local authorities, businesses and citizens). The search can be refined by region, type of applicant and type of measures.

Climate Change Financial Instrument – Latvia

The climate change financial instrument is a program included in the budget of Latvia. The projects implemented through the program include:

- Improving energy efficiency in municipal buildings (approximately **7 mil** Euro);
- Improving energy efficiency in university buildings (approximately **2 mil** Euro);
- Solutions for reducing greenhouse gas emissions in buildings reserved for vocational training (**3.5 mil** Euro);
- Solutions for reducing greenhouse gas emissions in industrial buildings (**2.3 mil** Euro);
- Solutions for reducing greenhouse gas emissions in buildings belonging to municipalities (**5 mil** Euro);
- Houses with low energy consumption (**2.1 mil** Euro)
- Employing renewables in the residential sector – micro-generation (**3.3 mil** Euro)

Eco-Loans With Zero Interest - L'éco-prêt à taux zéro – France

The facility was established in 2009 and the interest of 0% is meant to support building owners and administrators to finance rehabilitation measures for their properties. The upper limit of the loan is of 30 000 Euro and it is given for a maximum period of **10 years**.

The eco-loan is used to finance the measures necessary to improve energy efficiency and reduce greenhouse gas emissions and covers equipment as well as work costs, project management and insurance cost. In order to benefit from the eco-loan applicant must implement a combination of measures, including implementing at least two measures and ensuring that they reach a high level of energy efficiency.

Eligible measures include:

- Insulating roofs;
- Insulating walls;
- Replacing the heating systems or producing hot water;
- Installing a new heating system and employing renewables;

Among these at least two need to be implemented.

The energy consumption after the rehabilitation needs to be:

- Lower than 150 kWh/m²*year if it was previously above 180 kWh/m²*year,
- Lower than 80 kWh/m²*year if it was previously above 150 kWh/m²*year.

Loan Subsidies for Energy-Saving Homes – Poland

The program is addressed to individual clients building or purchasing a home (house/apartment).

The aid consists of a partial reimbursement of the contracted loan for the construction and purchasing of the home. The subvention is paid in the account of the client at the end of the project and after obtaining confirmation regarding the energy consumption of the building.

The value of the subvention varies depending on the level of energy efficiency reached, calculated according to national guidelines.

The program will contribute to:

- The partial payment of the loan, covering the largest part of the investment and partially the costs for verifying and validating the energy performance achieved;
- Decreasing the maintenance costs paid by tenants;

- Increasing the value of the building.

The budget of the program is of about 75 mil. Euro, which would allow for the financing of approximately 12 000 applications (house/apartment). The implementation of the program will take place during the 2013-2018 period.

ARBED -Strategic Energy Performance Investment Programme- Wales

The program is aimed at housing associations. ARBED was established with the aim of coordinating investments in energy efficiency and renewable energy in Wales – in order to maximize the economic potential of investments in energy efficiency for existing households.

The strategic objectives of the program are crosscutting:

- Environmental: improving the energy performance of existing households – particularly of the most inefficient ones- and decreasing greenhouse gas emissions;
- Social: **reducing the impact of fuel poverty for households;**
- Economic: generating employment opportunities for Welsh citizens and economic opportunity for Welsh companies in designing, producing distributing, installing and maintaining energy efficiency measures and renewable energy technologies.

The ARBED program covers energy efficiency improvement and renewable energy employment measures **supporting families with low income, fuel poor households in disadvantaged communities.**

Types of eligible organizations:

- Community groups;
- Housing associations;
- Local authorities;
- NGOs;
- Renters and groups of residents;
- Physical persons.

Eligible expenses:

The program finances only measures and technologies that have the potential to generate economic development in Wales. These measures and technologies include:

- Insulating walls;
- Installing photovoltaic equipment;
- Installing solar heating equipment;

- Heat pumps;
- Changing fuels;
- Specific solutions;

The program is in its second implementation phase since May 2011 and has a budget of about 45 mil pounds sterling (33 mil from the European Development Regional Fund and 12 mil from the Welsh government). During the first phase more than 6000 households were rehabilitated.

Energy Saving Obligations in the United Kingdom

The program is addressed to the residential sector in the United Kingdom and has as a secondary objective certain priority groups: fuel poor families and residence owners aged at least 70 years old. Energy providers must ensure **at least 40% of the energy savings target among the priority groups.**

The main types of measures are:

- Measures for improving thermal insulation;
- Efficient lighting;
- Efficient heating (heat pumps);
- Efficient equipment;

The administrator of the program is the regulator of the energy market.

For the 2008-2011 period, it is estimated that the value of the investments made as a result of the implementation of the obligation system will reach 3.2 bn. sterling pounds.

Obligations Scheme

The obligations scheme is a secure financing source for investments in the energy efficiency of buildings. In all of the countries in which obligations schemes have been instituted for energy providers/distributors, with or without a white certificate scheme, there is an obligation to finance energy efficiency projects in the residential sector, with targets for the population suffering from fuel poverty as well.⁴

In **Belgium-Flanders**, the eligible energy efficiency measures are based on strict standards for homes and buildings found within a catalogue containing more than 200

⁴ Preliminary evaluation report regarding current options for financing activities aimed at energy efficiency and fuel poverty, presented within the UNDP-GEF project "Improving energy efficiency in low income households and communities"

standardized projects. Eligible measures are presented under various forms such as: energy audit; information addressed to target groups, subventions for efficient equipment or combination of these. The energy savings achieved by owners for using solar panels or wind turbines are eligible projects for financing.

In **France** there are three categories of measures: standardized measures leading to consistent energy savings, un-standardized measures and **contributions to programs targeted towards addressing fuel poverty**, information sharing and training programs. Standardized measures are grouped in six categories, each of which is divided, as for each measure there is a presentation note containing: a description, technical installation requirements, lifetime of savings and value of the savings determined by three climatic areas, through specific measurement units.

In **Italy**, where there is a white certificate scheme, the Agency for Electric Energy and Gas periodically posts the updated list of energy efficiency measures, with the associated procedures for calculating energy savings and the lifetime of each energy saving measure. The energy and gas distributors are not restricted from implementing any other non-standardized energy efficiency measures, though then evaluation would take place on a case by case basis. By the end of 2012, **80% of certificates were generated by the measures for improving the energy efficiency of buildings.**

Energy Efficiency Fund

An **Energy Efficiency Fund** is another mechanism that can be used to finance investments in the energy efficiency of buildings. Examples of practices for energy efficiency funds⁵ can be found below:

- The Energy Efficiency Fund established by the European Investment Bank and other national banks;
- Public banks with low capital costs (such as in Germany, where the KfB is part of the energy efficiency financing program for homes);
- European funds and/or international banks:
 - **Estonia** instituted a revolving fund (long term lending, with low interest, creating the conditions for refilling the fund and, implicitly, the possibility of continuing to finance projects). The sources were ensured through ERDF (17 mil Euro), the national KredF fund (49 mil Euro) and the Council of Europe Development Bank (29 mil Euro). The results after the first year were the rehabilitation of 122 apartment blocks with average energy savings of 33%, compared to the program requirement of 20%.
 - **Bulgaria** – Energy and Energy Preservation Fund, with European Bank for Reconstruction and Development (EBRD) funds, being the first bank in Eastern Europe to finance energy efficiency projects in public and private buildings from a private fund.
 - **Slovakia** - Energy Efficiency and Renewable Energy Finance Facility (SLOVSEFF II) which was launched by EBRD, in collaboration with the Ministry of Economy and which finances projects in the residential and industrial sector.

⁵ Guide for Strong implementation Energy Efficiency Directive, The Coalition for Energy Savings(pdf)

3. Potential Financing Sources for Improving the Energy Efficiency of Buildings

The financing mechanisms used in energy efficiency projects are quite diverse. Research developed through the Intelligent Energy for Europe⁶ program confirm the general belief that energy efficiency projects have a special economic profile, since recouping the investment and obtaining profit results in most cases from a reduction in energy consumption and not an increase in income. This is one of the reasons why private investors avoid funding energy efficiency activities, as well as the long time period involved.

State/Local Budget

The most significant disadvantage of this type of financing (through subventions) is that during budgetary/economic crisis periods it is difficult to find the resources for financing energy efficiency, through transferring costs, taxes and fees onto the citizens.

Other public funds

- **Incomes from the auctioning of greenhouse gas emissions certificates obtained by Romania** and all other member states under the rules of the European emissions trading scheme (EU-ETS). This possibility, however, contains the challenge of an unstable income, since the price of the GHG certificates is established on the free market (for example, in 2013, the price varied between 6.35 € in January and 2.65 € in April). According to the Emergency Governmental Ordinance (EGO) no. 115/2011 the money will be used in projects aimed at reducing GHG emissions, projects adopted through a Governmental Decision, at the proposal of the ministry in charge of the subject matter with which the project is concerned, endorsed by the Ministry of Environment and Climate Change and the Ministry of Finance.
- **The income obtained through the sale of the assigned units (AAUs)** available to Romania under the provisions of the Kyoto Protocol for the 2008-2012 period. The primary legal basis for this type of transaction has been created, but there is at this time no demand on the market for this type of certificates. This is a highly uncertain source of income. According to EGO no. 196/2005, with later additions and changes (EGO 70/2013), the money could be used only for financing green

⁶ Alternative financing schemes for energy efficiency in buildings, Adrien Bullier, Project officer at the Intelligent Energy Europe programme European Commission, 2012

projects (those that lead to a reduction in GHG emissions). Financing is approved through a governmental decision.

- **The income obtained from monetizing available certificates allotted to Romania under Decision no. 409/2009 for non-ETS sectors.** The rules for the transaction of such certificates (among member states) are to be established by the European Commission. This is also an unstable source of income, considering the timeline necessary for establishing the legal framework, most probably after 2015. The Ministry of Environment and Climate Change and the Administration of the Environmental Fund would be the institutions responsible for managing these funds.
- **The income from the sale of certificates left over from the sale of the GHG emissions certificates in the Joint Implementation reserve** unused during the allocation of GHG certificates during the 2008-2012 period. This transaction has already taken place and the funds are in the account of the Administration of the Environmental Fund though this it does not amount to a high value. These funds can be used immediately, on the condition that there is a program (list of projects, with approved technical documentation).
- **Income from the Environmental Fund** obtained through various pollution taxes and penalties applied to economic actors for not conforming to the rules of the EU-ETS scheme and the green certificates scheme.

Other funds, such as those of the **Obligations scheme** of Directive 2012/27/EU if it is decided that the directive would be implemented this way, under article 7. In this case, a part of the contributions of the obligated parties could be directed towards programs for improving the energy efficiency of buildings. The value of the funds would be predictable and available annually. If the decision is to implement Directive 2012/27/EU with an obligations scheme than the institution managing it will be decided at the same time, since such a scheme would imply using a series of instruments for improving the energy efficiency of buildings.

European Funds – available for investments in the energy efficiency of buildings, the European Fund for Regional Development (ERDF).

Private capital:

- **Credits** to commercial banks, guaranteed by the state or partially subsidized by the state;
- Through an **energy performance contract (EPC)**. An energy performance contract is an integrated contract according to which an energy services company

(ESCO) evaluates and proposes measures for conserving energy and guaranteeing energy savings for the length of the contract. The energy savings are used to pay for the investment and the profit of the ESCO, after which, usually, the contract closes. There are two types of energy performance contracts: the first, according to which the owner of the building finances the investment and the ESCO guarantees the energy saving and the second, according to which the energy savings are split between the ESCO and the building owner, with the investment being financed by the ESCO.

Create an **Energy Efficiency Fund**, which ensures the availability of funds necessary to achieve the energy efficiency objectives and creates the opportunity to bring all the financing sources into one “basket”.

The decision regarding the categories of sources belongs to the member state.

Please find below examples of practices for different energy efficiency funds:

- The Energy Efficiency Fund established by the European Investment Bank and other national banks;
- Public banks with low capital costs (such as in Germany, where the KfB is part of the energy efficiency financing program for homes);
- National budgets (such as the experience of the US with housing rehabilitation legislation)
- European funds and/or international banks:
 - **Estonia** instituted a revolving fund (long term lending, with low interest, creating the conditions for refilling the fund and, implicitly, the possibility of continuing to finance projects). The sources were ensured through ERDF (17 mil Euro), the national KredF fund (49 mil Euro) and the Council of Europe Development Bank (29 mil Euro). The results after the first year were the rehabilitation of 122 apartment blocks with average energy savings of 33%, compared to the program requirement of 20%.
 - **Bulgaria** – Energy and Energy Preservation Fund, with European Bank for Reconstruction and Development (EBRD) funds, being the first bank in Eastern Europe to finance energy efficiency projects in public and private buildings from a private fund.

- **Slovakia** - Energy Efficiency and Renewable Energy Finance Facility (SLOVSEFF II) which was launched by EBRD, in collaboration with the Ministry of Economy and which finances projects in the residential and industrial sector.

4. Addressing financing energy efficiency in households suffering from fuel poverty

As mentioned in the Council Recommendation of July 9th 2013⁷, poverty continues to be a major challenge, particularly for Romania, where 29% of the countries population is under severe material deprivation (in 2011), compared to the European average of 8.1% (EU 27). **In 2011 40.3% of the population was at risk of poverty and social exclusion, compared to the European average of 24.2%.**⁸

At the beginning of the December of this year, EUROSTAT publicized the statistic indicators of the year 2012. **The number of people at risk of poverty has increased by 3.1% from 8,630,000 to 8,907,000.**

Considering that **8,907,000** of the citizens are in the situation of being exposed to poverty, and under the hypothesis that a family is formed of 2.45 people, an initial evaluation can confirm that **3,636,510 households are suffering from fuel poverty.**

Improving the energy efficiency of buildings and combating poverty and social exclusion are two of the priorities of the European Strategy for intelligent economic growth and favoring inclusion.

Although improving the energy efficiency of buildings requires significant investments, the European Commission underlined the co-benefits of actions taken to fulfill this objective, among which: creating jobs, reducing poverty, improving health, and a higher level of energy security and industrial competitiveness.⁹

Within the 2014-2020 programing period, one of the priorities of the European Union is the fourth thematic objective, namely “Supporting the transition to an economy with low CO₂ emissions in all sectors,” within which energy efficiency and investment in renewables for public infrastructure and residential buildings are covered. Compared to the current period, the value of the funds allotted to this area will reach approximately 17 bn. Euro.¹⁰ This increase in allocation is an opportunity for member states to develop

⁷ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2013:217:0067:0070:EN:PDF>

⁸ Partnership agreement proposed by Romania for the 2014-2020 programing period (first version, oct.2013)

⁹ Financial support for energy efficiency in buildings, COM(2013) 225 final

¹⁰ Cohesion Policy support for Energy Efficiency Investments, 2012, Maud SKÄRINGER European Commission Directorate-General for Regional and Urban Policy

new policies and implement new financial mechanisms which would contribute to improving energy efficiency and economic recovery, while at the same time reducing pressure on national/local budgets as well as on the family budgets of those affected by the rise in energy prices.

In the Partnership Agreement proposed by Romania for the 2014-2020 programming period, within objective four, “Supporting the transition to an economy with low CO₂ emissions in all sectors,” among the proposed financial priorities, one is: “action towards improving the thermal insulation of the residential and public building stock, prioritized on the basis of systematic evaluations which consider the cost efficiency resulting from the reduction of GHG emissions, social benefits, among which combating energy poverty and creating jobs”.

4.1. Evaluating the amount of funds necessary for the 2014-2020 period

In Romania in 2008 the estimated total area of building surface was of 516 mil sqm of which 455.78 mil sqm (88.5%) in residential buildings inhabited permanently. In terms of the rural/urban divide, the largest amount of building surface is in the urban environment, as revealed in the table below:

Residences and owned properties (thousands useable area)	2005	2006	2007	2008	2009	2010
Urban	54,5%	54,5%	54,4%	54,3%	54,2%	54,1%
Rural	45,5%	45,5%	45,6%	45,7%	45,8%	45,9%
Private	98,1%	98,1%	98,1%	98,0%	97,9%	97,8%

As to the theoretical final energy consumption of the current building stock, it is valued at between 150 and 400 kWh/(sqm*year), for buildings constructed before 1989 and at between 120 and 230 kWh/(sqm*year), for buildings constructed since 2000.

The highest rate of energy consumption belongs to heating (at nearly 53% of the total), while water heating contributes with only 13%.

In order to have a better image of the size of the market for energy efficiency improvement services, as well as an estimation of the effort needed for reaching the strategic objectives assumed by the EU and Romania, within the Intelligent Energy for Europe program, through the Built Up Skills¹¹ project, an analysis was made in order to aid national authorities.

The research proposed two scenarios on the implementation of measures for improving energy efficiency in buildings, with the target of reaching the objectives set out in the Europe 2020 Strategy, a pessimist and an optimist scenario. The second argued that improving energy efficiency is necessary for apartment blocks as well as single family homes.

¹¹ BUILT UP Skills – Romania, Report in the current state of affairs, 2012, Intelligent Energy Europe

Within the Report¹², working hypotheses were detailed with technical data regarding thermal rehabilitation work which were considered in order to evaluate financing needs. Along with the technical data regarding the works, in the abovementioned Report, a series of working hypotheses were considered, such as:

1. Type of household: multilevel building apartment with 60 sqm of useful surface or single family home with 70 sqm of useful surface;
2. The price of building materials remains unchanged;
3. The contribution of the state budget (50% of the value) stays at 1500 Euro/apartment (the estimated value based on available information regarding thermal rehabilitation work done under the National program, in the 2009-2011 period);
4. The estimation that the value of the rehabilitation of individual homes is now 30% more expensive.

It made an estimation of financing needs, only for actual investment work, within two scenarios: a pessimist and optimist one, resulting, according to the table below in a financial need for 2014-2020 somewhere between 1.68 bn Euro and 2.70 bn Euro only for the thermal rehabilitation of the building stock, without considering consultancy work, inspections, energy audits or design.

Household (HH) type	Pessimist Scenario		Optimist Scenario	
	No. HH/ year	Value (mil. Euro)	No. HH/ year	Value (mil. Euro)
Apartment block	40.000	120,0	60.000	180,0
Individual homes	25.000	97,0	40.000	156,50
Total	65.000	210,0	100.000	336,5
Total 2014-2020	520.000	1.680	800.000	2.692

At the national level, it is necessary to evaluate and rigorously plan the volume of works needed as well as the financial resources necessary for improving energy efficiency in the

¹² Draft assessment report on current funding opportunities for energy efficiency and fuel poverty in Romania, prepared as part of this project

residential sector. In order to reach the ample objectives of the “Roadmap for moving to a low-carbon economy in 2050,” studies were made, including for Romania¹³. In order to reach the European objectives (meaning a reduction in carbon emissions of 80%-90% in the buildings sector by 2050), it is necessary to reduce emissions by about 3 kgCO₂/(sqm*year).

¹³ Implementing nearly Zero-energy Buildings (nZEB) In Romania –towards a definition and roadmap, 2012, Bogdan Atanasiu, BPIE

4.2. Possible programs/financing schemes for addressing fuel poverty

In chapter three potential financing sources for energy efficiency in buildings were described generally, each with a smaller or larger degree of predictability on the timescale subject to analysis, for the 2014-2020 period.

In section 4.1 an evaluation of financing resources necessary for improving energy efficiency in buildings, starting from a series of hypotheses and based on available information. We must however keep in mind that the expenses for preparing the projects were not taken under consideration (technical inspections, energy audits or design).

We observed that according to the optimist scenario nearly 800 000 households would be rehabilitated in eight years, and there are an estimated 3 600 00 poor households.

Among the presented good practices, it can be observed that households suffering from fuel poverty are subsidized entirely by ensured funds:

- By the national budget (Austria, UK, Wales);
- Through the obligation scheme imposed on energy suppliers/distributors:
 - UK - of the energy saving target must be reached through action for the priority groups(suffering from fuel poverty, people of over 70 years old);
 - France imposes on the obligated parts contributions to programs targeted at fuel poverty;
 - Italy, which has a white certificate scheme, allowed for freedom regarding which areas to invest in for energy efficiency for final consumers, so as to reach the targets. In 2012, 80% of white certificates were generated by investments in the energy efficiency of buildings.

In the draft Partnership Agreement for the 2014-2020 programming period, the management authority for ERDF belongs to the Ministry for Regional Development and Public Administration (MDRAP), the institution responsible for developing energy efficiency programs for buildings.

In Romania there is the experience of the National Program for the thermal rehabilitation of buildings for which owners needed to ensure 20% of the investment cost. The same co-financing percentage from owners was cited in the Thermal Rehabilitation program financed through European funds starting in 2012. In the case of this program there was variation in the percentage according to the medium income of the apartment block, so that the local public authority could cover a part of the contribution owned by the owners association.

It is essential that annually, **at least 40% of the funds of the rehabilitation program to be directed towards financing those suffering from fuel poverty.**

For single family homes, a separate program could be designed, considering the difficulty and time constraint of obtaining the signed consent of all tenants for the rehabilitation work, and within this a sub-program dedicated to those suffering from fuel poverty.

The Administration of the Environmental Fund could develop a **Program for reducing the greenhouse gas emissions of households** through which to finance thermal rehabilitation work in fuel poor households. Financing would come from the incomes of the fund: environmental taxes, EU-ETS auctioning and the potential income generated under decision 406/2009. In this case we need to underline the need/requirement of a guide regarding the monitoring of the results (CO₂ emissions reductions and energy savings, so as to avoid double counting).

If it is decided to implement Decision 2012/27/EU through an obligations scheme, a part of the funds should be directed towards the thermal rehabilitation of buildings, in a fuel poverty program.

5. Conclusions and recommendations

From those presented above we can observe that there are good practices regarding energy efficiency, in buildings and there are programs/targets for financing households suffering from fuel poverty. We must however underline that these have been built in time, using types of sets of data that is not at the moment available in Romania or are not structured or systemically gathered in databases.

In order to more precisely estimate the financial resources necessary we should have access to:

- Building stock inventory: apartment blocks and single family homes in the rural and urban environment, the inventory is required by current legislation, but has not yet been finalized. City Halls which have signed up to the “Covenant of Mayors” should have such inventories since they have estimated emissions coming from the residential sector.
- Also still being developed is the inventory of buildings occupied by the public administration (offices), including buildings belonging to the public administration (schools, hospitals, etc...).
- Households suffering from fuel poverty, initially households receiving heating aid (buildings inhabited by: in apartment block A there are X families receiving heating aid, and among single family homes there are Y households receiving heating aid).
- Information regarding individual rehabilitation costs for programs pursued so far; an analysis could be made regarding the efficiency and economics of the spent funds.
- Information regarding the results of performed rehabilitations in terms of: annual energy savings and annual emissions reductions. We must underline that these are indicators required by the regulations for structural funds in the 2014-2020 period.

The legislation on the energy performance of apartment blocks, beginning in 2009, through EGO no. 18/2009 has undergone a series of changes and additions. The ordinance contained the requirement for local authorities (mayors, as coordinators) to perform a building stock inventory within 60 days.

Law no. 158/2011 introduced a significant element, the possibility of tax exemptions for houses owners who financed their own thermal rehabilitation for 7 years, if the changes are certified through an energy performance certificate.

OUG 63/2012 introduced a financing scheme through European funds, with an improved financing structure (adapting the contribution of owners based on their income), and the improvements eligible for funding, other than the rehabilitation of buildings, include: refurbishing the heating system and including renewable energy sources to use, if possible. There were sanctions that had to be imposed if local coordinators did not perform the building stock inventory.

Another addition to the law is the thermal rehabilitation tax. It states that in case that the owners' contribution cannot be covered entirely/partially, the Local Public Authority (LPA) can cover that percentage and recovers the sum through a thermal rehabilitation tax, approved by the local council, which allows local authorities to recover the supplementary funds covered by the (LPA) from owners/owners associations (in at most 10 years from the improvements, according to Law no. 238/2013). There are specified categories of citizens that are exempt from paying the tax (handicapped people, single pensioners, and others).

Finally, Law no. 238/2013 which approved EGO no. 63/2013 introduced the following elements: local programs are developed within the limits of the funds available in local budgets, with priority given to social housing owned/under the administration of local councils, regardless of whether we are speaking of apartment blocks or single family homes.

In this situation a part of the households suffering from fuel poverty will be undergoing energy performance improvement work.

As a novelty, there was an extension of the definition of single family homes: *“the building to be inhabited, with two levels aboveground at most and two location units owned by two distinct physical persons, is assimilated to the single-family household. These do not constitute an owners association under the law.”*

This part of the law had the role of highlighting the need to republish the law, giving the articles new numbering for clarity and in order to avoid possible interpretation errors on the part of local authorities, and not least of all, in order to allow for the design of local authorities financing schemes.

This type of scheme could be developed slowly, until the law is adopted containing a definition of “fuel poverty” along with an appropriate calculation methodology.

At this point, based on current legislation, we propose the following:

- **“Energy Efficiency for Households Suffering from Fuel Poverty,”** a financing scheme built by local public authorities (LPA) with the following financing structure: 50% LPA funds and 50% of the funds from the auctions of the EU-ETS

scheme. The costs for the preparation of projects of this program being paid by the LPA (technical inspections, energy audits or design).

The program designed by the LPA would be validated by the Ministry of Regional Development and Public Administration and approved through a Governmental Decision, according to EGO no. 115 (the funds already exist at the Ministry of Public Finance);

- **“Reducing Greenhouse Gas Emissions in Households Suffering from Fuel Poverty,”** a scheme that could be developed together with Environmental Fund Administration (EFA) with the same financing structure for projects (50% LPA, 50% EFA), with the EFA funds coming from environmental taxes and income from the transaction of GHG certificates from the Joint Implementation Reserve, unused in the 2008-2012 period.

What should be underlined is the fact that along with the information provided at the beginning of this chapter (building stock inventories, databases of low income citizens who receive heating aid) which is necessary in order to design coherent financing programs, these programs will need to have associated results monitoring guides (energy savings, GHG emissions reductions).

Investments in energy efficiency in households suffering from fuel poverty, along with the state of being of the citizen, will also lead to the decrease of heating bills and, in time, lessen the budgetary strain through reducing the need for heating aids.

In order to reach this objective, it would be most appropriate to develop a program dedicated specifically to this objective: **“Improving Energy Efficiency for Households Suffering from Fuel Poverty”** (with the examples of Wales, which has a program aimed at such citizens, as well as the UK, which has in its obligations scheme an express requirement to address energy efficiency with vulnerable groups). Such a program would need to gather more financing sources than those mentioned above.

This type of program could be constructed for the 2014/2015-2020 period, at an initial evaluation, considering the hypotheses in chapter 4.2, results in: a pessimist scenario (50 000 households rehabilitated annually) with costs reaching about 1.2 bn Euro and an optimist one (75 000 households rehabilitated annually) with costs reaching about 1.7 bn Euro by 2020.

The obvious conclusion is that financing energy efficiency, whether for the general population or households suffering from fuel poverty in particular, is an extremely complicated issue needing all resources to be mobilized, in terms of technical, professional, financial and decisional expertise, in order to find a solution.

The resources could come from ERDF and the obligations scheme designed under article 7 of Directive 2012/27/EU, with a clearly defined degree of certainty.

A decision regarding the implementation of Directive 2012/27/EU through an obligations scheme is important and urgent at the same time. So far, in all countries employing an obligations scheme programs/sub-programs are being developed, with monitored results of energy savings of households suffering from fuel poverty.

In order to design viable financing schemes multiannual planning is essential, and it implies a deep understanding of the current situation at the level of LPAs, regions and evidently, at the national level. Building stock inventories are being developed, but should be correlated to the number of persons suffering from fuel poverty (those receiving heating aid), and not least of all information on the average rehabilitation costs for each type of residence.

For each of the presented formulas of financing schemes, it is evidently extremely important to monitor results (in terms of energy savings and GHG emissions reductions), so as to avoid double counting. These type of requirements are present for each of the financing sources. (EU-ETS, ERDF, the obligations scheme, EFA).