



Action Plan of the BUILD2LC Project:

Combating Energy Poverty

and

Financial Instruments in Energy Renewal of Buildings



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1 General information

PROJECT: Boosting Low Carbon Innovative Building Rehabilitation in European Regions (BUILD2LC)

PARTNER ORGANIZATION: North-West Croatia Regional Energy Agency (REGEA)

COUNTRY: CROATIA (HRVATSKA)

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2 Policy Context

- THE ACTION PLAN AIMS TO IMPACT:
- Investment for Growth and Jobs program
 - European Territorial Cooperation program
 - Other regional development policy instrument**

NAME OF THE POLICY INSTRUMENT ADDRESSED: Croatian Operational Program 2014 - 2020.

Objective T.O. 4. Supporting the shift towards a low carbon economy in all sectors, concretely
Priority Line 4.c: Support the Energy efficiency and use of renewable Energy in public infrastructure, including public buildings and households.

3 Details of the actions envisaged

3.1 Action1: Energy Efficiency Retrofits for Family Houses in Croatia

3.1.1 The background (please describe the lessons learnt from the project that constitute the basis for the development of the present Action Plan)

Based on the census (2011) in Croatia there are a total of 1.923.522 (1.496.558 occupied) dwellings for permanent habitation [1], out of which family houses make about 65% of the stock[2]. 65% of the total housing stock is at the continental Croatia and households make more than 30% of final energy use. Most of the housing stock was built before 1987, which means they do not meet even basic technical regulations (see Figure 1*Error! No se encuentra el origen de la referencia.*) and have poor, if any, thermal insulation. Those types of buildings typically require over 200 kWh/m² of energy. If compared to normal standard of modern construction with less than 100 kWh/m², or with low energy houses with less than 40 kWh/m², it is evident, there is significant potential for energy reduction in the housing sector, particularly in the family houses. Heating, cooling and domestic hot water preparation make for 70% of the total household energy use which further stresses the potential for energy reductions via building envelope retrofits.



Figure 1 Dwellings by construction year and occupancy status (left) and photo of residential house with poor efficiency (right) [3]

Based on the low energy efficiency levels, most of those dwellings fall into energy class E or lower thus offering potential for up to 60% of energy reductions.

In addition to the poor housing stock in terms of energy efficiency, there is prevalent problem in covering costs of living in those buildings. For 58% of Croatian population housing costs present heavy financial burden[4] and 9,3% of the households are unable to keep their homes adequately warm [5]. These trends are in line with common trends in the post-socialist and transitional economies where energy was traditionally low cost and dwellings were built inefficiently. With increase of energy prices, more families are left in energy poverty. What is specific for Croatia is that there is a high ownership rate with almost 90% population owning their flats/houses. This national specificity of high ownership rates

creates opportunity for easier implementation of any energy efficiency retrofit program aimed to be implemented on a household level.

In Croatia there is a high at risk of poverty rate of 20%, and 29,1% of population are at risk of poverty or social exclusion [6]. The most vulnerable group in that aspect is single female households with at risk of poverty rate of 41.1%. Those groups should be considered for inclusion in the vulnerability criteria when designing national programs for talking energy poverty.

Recognizing the need to improve residential housing stock Croatian Government has adopted "Program for renovation of family houses for the period 2014-2020" (OG 43/14, 36/15)¹ which is based on the 2nd National Energy Efficiency Action Plan. Through the program it is planned that a total of 56GWh of energy are saved annually through three different measures: 1) Retrofitting building envelope; 2) Heating system replacement; 3) Promotion of renewable energy sources (RES) use.

While the "Program for retrofitting of family houses" (Program) has already had success and it is likely that it has indirectly contributed to fight against energy poverty by preventing some of beneficiary households to fall into energy poverty, it did not specifically target energy poor and energy vulnerable households. It is the aim of this action to include social criteria thus enabling direct impact of the Program on eradication of energy poverty.

Similar cases of social criteria have been introduced during the Gloucestershire BUILD2LC visit and during the Skype Bilateral Meeting organized at Croatian Ministry of Construction and Physical Planning².

3.1.2 Actions to be implemented

The main task of the action is to develop social criteria to be incorporated in the upcoming public call for retrofitting of the family houses. Ministry of Construction and Physical Planning has for that purpose set up an expert committee, which has a task to develop the needed social criteria in a participative manner. The following organizations have their experts as members of the committee: Ministry of construction and physical planning, Ministry of environment and energy, Ministry of demography, family, youth and social policy, Regional Energy Agency of Northwest Croatia (REGEA), Regional Energy Agency North, Green Building Council Croatia, Society for Sustainable Development Design (DOOR).

Direct contribution of the REGEA will be achieved by fostering the development of social criteria and providing expert services in analysis of existing best practice examples from EU countries. Some of criteria which can be used, and which are currently under consideration, are setting of the limits for living area which can be considered eligible for retrofit based on social criteria. In that case a possibility considered is using existing criteria from the "Ordinance on setting up a status for ex carriers of tenant rights and their family members" (OG 133/2013) which states: 35m² are eligible for retrofit for a single member household, 45m² for two members households, 55m² for three members, 65m² for four

¹ <https://narodne-novine.nn.hr/clanci/sluzbeni/dodatni/431066.pdf>

https://narodne-novine.nn.hr/clanci/sluzbeni/2015_03_36_742.html

² <https://www.energypoverty.eu/policies-measures>

member and 75m² for five and more members. As the criteria is rather narrow within the action by using best-case examples widening of criteria and means for their justification will be elaborated.

Further criteria which need to be elaborated are:

Social welfare status of household members;

Health and disability status;

Number of children and elderly;

Employment and income and property ownership;

Also, within the action financing models will be elaborated in further details and means of their application. The application for vulnerable households needs to be user-friendly and it is likely that local actors, i.e. local authority and local welfare offices will need to facilitate preparation of the needed documentation for the vulnerable households to be able to apply and meet the criteria of the call. Most of the vulnerable households are unlikely to be aware of the call once it is issued and they will not have the capacity to fill in the required data or obtain needed documentation. Other issue which will be targeted with this measure is the question of pre-financing for the vulnerable households. Vulnerable households are unlikely to be able to pre-finance the retrofitting costs so alternative financing models will be investigated.

3.1.3 Players involved

Ministry of construction and physical planning

- In charge or managing the Action and coordinating the expert working group.

Ministry of environment and energy, Ministry of demography, family, youth and social policy

- Members of the working group and collaborating on development of the social criteria.

Environmental Protection and Energy Efficiency Fund

- Managing the funding of the scheme and issuing the call.

Savings banks

- Provision of co-financing and no-interest loans.

Local and regional authorities

- Support in managing the scheme, identifying the vulnerable households and preparing needed documentation for the vulnerable households.

Regional Energy Agency of Northwest Croatia

- Providing insights into international best-practice cases and facilitating the timely development of social criteria and adequate implementation mechanism.

Regional Energy Agency North

- Providing expert inputs to the development of social criteria and sharing experiences of the Social Green Interreg Project³.

Green Building Council Croatia

- Providing expert inputs and guidance on how to incorporate green building standards into retrofit programs.

Society for Sustainable Development Design

³ <https://www.interregeurope.eu/socialgreen/>

- Providing expert inputs on development of social criteria and facilitating the participative process of their development

3.1.4 Timeframe

March- December 2018: Designing social criteria for the new public call for retrofitting of the family houses

December 2018 - May 2019: Public call open⁴

May - December 2019: Beginning of implementation

3.1.5 Costs

In first programming period (2014-2016) the Program was financed through the National Environmental Protection and Energy Efficiency Fund and family houses were entitled to 40%, 60% or 80% of subvention (with a total limit of 168.000 HRK, ca. 22.500 EUR, per house) based on the area where the family house was located. Based on the guidelines of the European Commission geographical distribution will no longer be used as a way for setting up the cost limits. It is thus recommended that within this Action detailed social criteria is developed enabling use of higher financing rates based on vulnerability status.

By the year 2020, a total of 100 million EUR is planned for retrofitting residential sector, out of which 30 million is planned for retrofitting of the family houses [7].

3.1.6 Funding sources

- Environmental Protection and Energy Efficiency Fund, through own funds and EU funds
- EU Operational Program Competitiveness and Cohesion 2014-2020
- Local and regional authorities
- Private entities and physical persons

3.2 Energy advisors for energy poor households

3.2.1 The background

Energy poverty, the inability to access or afford modern energy services and to use them at adequate level which is socially and culturally acceptable without adverse impacts on health, is a growing concern in the whole of EU. Households in Croatia are responsible for almost 30% of total country's final energy demand and 40% of electricity demand. While the entire residential building stock has poor energy performance with heating requirements typically exceeding 200 kWh/m², the situation is even worse for the households with limited financial means. Some of the dwellings have questionable static integrity and it is unlikely that all will be technically viable to retrofit.

It has been proven through the pilot projects in various EU countries⁵ and in Croatia that providing simple and low-cost energy efficiency measures and educating household members on rational energy

⁴ The question marks are as it is beyond the scope of this action to set exact dates; those are to be determined by the competent authorities

⁵ www.reach-energy.eu , <http://www.nea.org.uk/>, With knowledge to Warm Home and many others

use provides quick and easy start in alleviating adverse impacts of living in energy poverty. This action thus aims to offer not a full solution to the energy poverty but a good start in that direction.

A good practice example which could be used to transfer some of experience from the [Warm and Well](#), was seen during the Interregional Thematic Seminar - New energy culture, citizen involvement and energy poverty held in Gloucester, UK in Tuesday 13th and Wednesday 14th June 2017. Warm and well amongst their services offers access to information of available grants and funding schemes through their trained staff. Warm and well also *offers energy efficiency advice to householders and administers grant funding on behalf of the local authorities and other funders*.

Second good practice example on which this action builds is the Slovenian case. This case was also presented during the Gloucester Thematic Seminar. In Slovenia there is a [network of energy advisors for energy poor](#) which has been officially set up after the project [REACH](#) has proven that provision of low-cost energy efficiency measures combined with energy savings advice can result in improvement of life quality, decrease of adverse impacts on health and contribute to energy reductions. As Croatia has also been in the same project as Slovenia and same principles have been successfully tested as pilot, this type of approach is likely to be success.

Another best case on which this action builds is the Lithuanian MAB program, which has initially struggled to find installers who had the correct skills to complete the work to a high quality. Valuable lessons learned via that program, on how to choose and train installers (or in case of this Action, advisors) will be further investigated and applied to build on lessons learned and avoid initial hurdles.

Network of energy advisors to the energy poor established through this action will also build on the example of "Warm and Well" but keeping more similarity to the Slovenian case due to national similarities.

3.2.2 Action to be implemented

Energy advisors for energy poor homes have the aim to set up a national network of offices where citizens could turn to seeking energy advices. Those offices will not only work on the "open doors" principle, but they will also hire qualified and trained staff, energy advisors, who will be able to do the field work and visit the households in need.

The action will enable a pilot network setting up offices in at least four different cities across Croatia, building on already existing knowledge from previous advisors network which was set up by UNDP (not aimed at energy poor), and also consider providing employment for young unemployed people who have completed the course for energy advisors organized with the support of the European Social Fund within the program "Advisors for efficient energy use".



Figure 2 Example of the simple and low-cost EE kit provided to the visited households within the project REACH (left), energy advisor replacing an incandescent light bulb with LED bulb (center) and installed reflective foil (right)

The action will include education of local authorities and preparation of the advisor network and starting a pilot program for 1.000 households in Croatia to be visited by the energy advisors. All the visited households will also be provided with the low-cost energy efficiency measures. The measures to be provided to the households include LED light bulbs, draught proofing for windows and doors, timers for electrical boilers and similar (see Figure 2).

First step of the action is ensuring that the measure formally adopted by the Government (now it is in draft in the 4th National Energy Efficiency Action Plan (NEEAP)⁶ for the period 2017-2019). The NEEAP should already have been adopted, however there have been some delays so REGEA will contribute in that segment by fostering dialogue on importance of timely adoption.

Proposed measure in the draft 4th NEEAP is H.3 “Building capacities for tackling energy poverty”.

Second step to be facilitated by REGEA as regional energy agency with fully capacitated staff is to contribute to successful transfer of knowledge to local authorities and to advocate and support setting up the advisors’ base in at least one local authority in their area of operation. The advisors should also be trained to help households in providing information for financing mechanisms and thus this Action should directly contribute to Action 3 “Details of the actions envisaged

Action1: Energy Efficiency Retrofits for Family Houses in Croatia” through enabling easier access to retrofit program funds to the vulnerable households.

Overall the action foresees setting up a total of 15 info-offices in 15 different local authorities across the Croatia by the year 2020.

3.2.3 Players involved

Ministry of environment and energy

- Competent authority for the implementation of the Action;

Ministry of construction and physical planning, Ministry of demography, family, youth and social policy

- Contributing to the setting up of the scheme and designing criteria for vulnerability which will enable better targeting of the measure and design of needed low-cost measures packages;

Environmental Protection and Energy Efficiency Fund

- Managing funding and setting overall setting up of the action;

⁶ 4th NEEAP draft is available on: https://ec.europa.eu/energy/sites/ener/files/documents/hr_neeap_2017_hr.pdf

Regional Energy Agency of Northwest Croatia, Society for Sustainable Development Design

- Fostering dialogue and ensuring timely adoption and implementation of the Action; transferring knowledge and best-case examples and lessons learned from other countries and already implemented similar schemes; Supporting establishment of the advisors' network and choosing of and capacitating pilot cities;

Green energy cooperative

- Sharing best case examples and possibly providing initial staff for some of the cities through their network of trained energy advisors (currently unemployed young practitioners)

Local authorities (15 across Croatia)

- Providing facilities and managing the Action locally;

3.2.4 Timeframe

March 2018 - September 2020

3.2.5 Costs⁷

First phase requires investigation of existing capacities of local authorities and estimation of the need for new knowledge, design of info and promo materials and preparation of calls for cities to apply (200.000HRK, ca. 27.000 EUR by the end of 2018);

Second phase includes three local research studies and promo campaigns and three local pilot programs (660.000HRK, ca. 89.000EUR by end of 2018);

Third phase foresees a full start of 15 local programs with overall coordination, monitoring and promotion (2.450.000 HRK, ca. 330.000EUR by end of 2020);

3.2.6 Funding sources (if relevant):

Main funding source is Environmental Protection and Energy Efficiency Plan using funds acquired via the trading of the emission allowances in auction of emission trading scheme (ETS) based on the national Law on Air Protection (OG 130/11,47/14).

Additional funding sources include local and regional authorities primarily through provision of office space and equipment and where possible additional funding for increasing impact of the Action. Further funding sources include BUILD2LC project via REGEA's work, and other EU funded projects with which synergies will be established.

3.3 Program for eradicating energy poverty

3.3.1 The background

Currently it is not possible to precisely identify energy poor nor energy vulnerable in Croatia, as there are no available databases which are detailed enough. Instead, current practice defines specific groups, which are vulnerable and more likely to be energy poor. For example, it has been determined that socially vulnerable households are significantly more often energy poor than the national average, and that families with only a single parent are also significantly more likely to be energy poor than families with both parents. Additionally, pensioners and elderly are more commonly energy poor than employed

⁷ Source: Modified from measure H.3 of the draft 4th National Energy Efficiency Action Plan

persons [8], [9], [10]. In conclusion, vulnerable consumers of energy are those who, according to the socio-demographic and energy indicators linked to their households, have a higher probability of becoming energy poor than the general population. Careful definition of vulnerable consumers is a key to success of policies for tackling energy poverty. In Croatia, there is no all-encompassing definition of a vulnerable consumer, nor are there methods for confirming and monitoring energy poverty, however there is public policy which concerns (in part) vulnerable consumers (customers).

Additionally, currently in Croatia there is no program specifically aimed at energy poor households. In the Energy Act (OG 20/12, 14/14, 95/15, 102/15) vulnerable consumer is defined as a consumer from the household category who, due to their socially vulnerable status and/or due to health status has the right to receive energy under specific conditions.

As the first step in designing policies aimed at tackling energy poverty, in September 2015, the "Regulation on criteria for achieving the status of vulnerable consumer" was adopted. The Regulation states that funding for the compensation for energy costs of vulnerable consumers shall be secured by way of solidarity fee in the amount of 3 lipa/kWh (0,4 Euro cents/kWh) for all final customers, which for the average household will amount to roughly 6 HRK (0,81 EUR) per month. To date (March 2018) an agreement with suppliers is in effect in which they foreswear profit as the way to satisfy funding, and social compensation for the end consumer was set to zero.

The "Regulation regarding the monthly amount of compensation for vulnerable customers of energy, the method of cooperation in easing energy expenses of recipients of compensation and dealing of authorized centers for social welfare" (OG 102/15) defines that the amount of compensation for a vulnerable customer is set to the amount not exceeding 200 HRK (27 EUR) per month. Based on the determined status of vulnerable customer, the user has the right to compensation for vulnerable customers of energy to help finance electricity expenses. Overall, there is a lack of clear policy framework for protection of vulnerable consumers in Croatia and while the basic requirements of EU Directives have been met, the framework is lacking in its impact on different vulnerable groups and on different culprits of energy poverty. Development of this program (Action) would enable setting up a clear policy agenda for tackling energy poverty in Croatia and it would enable much needed monitoring and measuring of real policy impacts.

As it was presented during the Skype bilateral BUILD2LC meeting between North-west Croatia Regional Energy Agency (REGEA) and Severn Wye Energy Agency (SWEA) from UK, there are good case examples of implemented national programs and policies to tackle energy poverty which are available now via the European Energy Poverty Observatory⁸. Our program for eradicating energy poverty has been mostly developed based on the England national strategy to tackle fuel poverty - "Cutting the cost of keeping warm – a fuel poverty strategy for England"⁹ - but it also combines other good practices presented by SWEA such as: "ACHIEVE – Actions in low income Households to Improve Energy efficiency through Visits and Energy diagnosis" and "Warm & Well – Energy Efficiency Advice and Installation Scheme", to provide tailor-made solutions specifically for Croatia.

⁸ <https://www.energypoverty.eu/>

⁹ <https://www.gov.uk/government/publications/cutting-the-cost-of-keeping-warm>

3.3.2 Action to be implemented

This Action was proposed and accepted to be put in the draft of the 4th National Energy Efficiency Action (NEEAP) plan as measure H.5. The 4th NEEAP is yet to be adopted although it is targeted for the period 2017-2019. So, the first step in ensuring this action to be done within the BUILD2LC will be advocating to the competent authorities to adopt the NEEAP as soon as possible so that funds for implementation of this measure could be allocated. The Action itself is a key milestone in Croatian efforts to tackle energy poverty.

The actin includes conducting analysis of the situation and proposing wider definition of energy vulnerability as compared to current Croatian system (only users of social welfare and disability support). It also includes analysis of statistical data available and proposal of measures which would enable monitoring of success of policies. This may include bringing measurable definition of energy poverty and proposal of relevant changes in the legislation.

This action also foresees design of the basis for whole system aimed at tackling energy poverty in Croatia including analysis and pilot implementation of measures such as discussed in Action 2 “Energy advisors for energy poor households” but also measures of higher financial burden such as:

- Replacement of household devices on the “old- for –new” principle;
- Replacement of windows;
- Replacement or modification of heating systems (including implementation on heating systems in dwellings which currently have none which would result in increased overall energy use, but it would also reduce adverse health impacts and overall cost for society);
- Retrofitting building envelope (such as presented in Action 1 “Details of the actions envisaged
- Action1: Energy Efficiency Retrofits for Family Houses in Croatia” but also applicable to multifamily residential buildings);

This action also requires setting up more functional system for gathering and monitoring data and requires cross-sector and inter-ministerial collaboration. This action will form a solid base for real progress in reducing energy poverty in Croatia.

3.3.3 Players involved

[Ministry of environment and energy](#) and [Ministry of environment and energy](#)

- In charge of managing the Action and issuing a public call for the development of Program; Also, in charge of managing the implementation of measures as they will be designed within the program and ensuring achievement of targets set;

[Ministry of construction and physical planning](#) and [Ministry of demography, family, youth and social policy](#)

- Managing certain sub-sections of the Program, that is, specific measures; contributing to the participative process of development of Program;

[Regional Energy Agency of Northwest Croatia](#) and [Society for Sustainable Development Design](#)

- Ensuring expert inputs to the development of Program and ensuring that process is timely and participative;

[National Bureau of Statistics](#)

- Providing necessary data and implementing monitoring of energy poverty subject to criteria to be developed in the Program;

3.3.3.1 Timeframe

Overall duration of the Action as foreseen by the 4th NEEAP is from 1.1.2017.- 31.12.2026. However, the NEEAP has not yet been adopted by the Croatian Government and the impact done within the BUILD2LC project is limited to period from March 2018 – September 2020.

First interim as planned in the 4th NEEAP was supposed to be from 1.1.2017 - 31.12.2018. This Interim period has, due to afore mentioned lack of formal adoption, not yet started. It is expected that main impact to be done within this period is advocacy work with the competent authorities in order to ensure adoption which would then enable start of programming the financing by relevant institutions and, also enable kick-off of the actual measure implementation.

2nd Interim period is foreseen from 1.1.2019 - 31.12.2020. During the second Interim main impact to be done with the BUILD2LC is transferring good examples from other EU countries how to take all the measures, which will be developed to real practice.

3.3.3.2 Costs

In 2017 the initial planned costs are approximately 200.000 HRK (ca. 27.000 EUR) planned for developing the actual Program as a policy document. This cost is now transferred to 2018 as the 4th NEEAP has not yet been formally adopted. Further 40 million HRK (ca. 5,4 million EUR) is planned for implementation of first phase of measures as they will be elaborated in the Program.

3.3.3.3 Funding sources

Main funding source is Environmental Protection and Energy Efficiency Plan, through use of funds acquired via the trading of the emission allowances in auction of emission trading scheme (ETS) based on the national Law on Air Protection (OG 130/11,47/14).

Additional funding sources include local and regional authorities primarily through provision of office space and equipment and where possible additional funding for increasing impact of the Action. Contribution to the Action will also be ensured via the BUILD2LC national activities, specifically through REGEA's involvement in ensuring expert inputs to development of the Program as well as through fostering of timely adoption and participative process of development.

Other funding sources which should be considered for certain segments of this action, i.e. replacement of the household appliances, include private donors. One good example is from the Belgium where collaboration has been set up with Bosch household appliances where they provide their appliances for 10 years rent to vulnerable households, in collaboration with other local actors.

3.4 Energy Poverty Action Plan for City of Zagreb

3.4.1 The background

City of Zagreb as the national capital and the largest city in Croatia has poorly developed system for monitoring and eradicating energy poverty. Currently, similar as on national level, the only policies in place which partially help the energy poor are based solely on the existing social welfare criteria. City of

Zagreb has ensured that its beneficiaries have, in addition to the 200 HRK (27 EUR) deduction from electricity bills, the possibility to have significant share of their monthly bills covered by the City. This applies to all the communal services including energy and water bills.

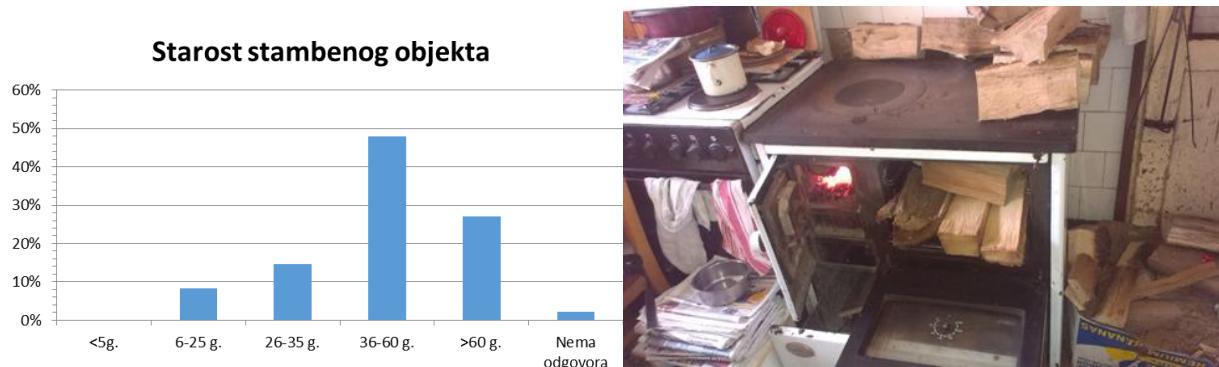


Figure 3 Average age of dwelling visited by energy advisor in Zagreb (left); Photo taken during the field visits to energy poor homes in City of Zagreb (right) [11]

Furthermore, City provides its most vulnerable citizens with social housing, where commonly rent is in significant extent also covered by the City. There is no system of monitoring actual consumption of energy and water within city's beneficiaries and there is no thorough database on actual energy certificate of the dwellings, which are owned by the city.

There is a clear need for setting up a functional system on City level, which would enable monitoring energy, social and demographical data while also protecting the private data of each single beneficiary. This system should thus be implemented on the City level where aggregated data would be publicly available to enable insight to researchers and interested public and enable better design of the in-house and national policies[11].

There is also a great need to broaden the criteria for vulnerability, as many households, which currently face heavy financial burden of housing and energy costs, are unable to receive any kind of support. This action will enable City of Zagreb to start with more thorough approach in tackling energy poverty.

This Action builds on similar cases of national programs as described in the Action 2 Energy advisors for energy poor households (A good practice example which could be used to transfer some of experience from the [Warm and Well](#), was seen during the Interregional Thematic Seminar. Second good practice example on which this action builds is the Slovenian case. This case was also presented during the Gloucester Thematic Seminar). The main difference to that is the scope of application (local rather than national) and the responsibility for manage the scheme. This type of action will enable direct involvement of local authorities and contribute to decentralization.

This action will also build on synergies with the Social Green project¹⁰ in the segment of city- owned building.

3.4.1.1 Action

This Action will enable City of Zagreb to start up a monitoring system for energy poverty related indicators in its area. Guidelines for setting up criteria for more detailed division of eligibility for certain

¹⁰ <https://www.interregeurope.eu/socialgreen/>

benefits will be developed. The guidelines will include comparison of investment in to energy efficiency cost and direct financial support. They will also offer an opportunity to include those citizens which were not yet formally able to receive any kind of support from the City. The model for monitoring energy costs of City of Zagreb's beneficiaries and related expenditures will be designed and developed. Model will be developed in a way which will enable collection of not only energy costs and related data but also overlapping of those data with data on income, property ownership, usage of city's properties and other data i.e. demographical information. Action will use best case examples for other countries and large cities to ensure that model is developed in timely manner and in a tested version adapted to specific national and local circumstances.

The action will also include training of the students of University of Zagreb Faculty of Electrical Engineering and Computing (FER) as it will build on newly started EU funded project "Fair solutions for better community" (hr. *FER rješenja za bolju zajednicu*) funded by the European Social Fund and implemented by the DOOR, FER and City of Zagreb. This way an added value will be created through enabling synergies between two Interreg program funded projects (BUILD2LC and Social Green) and ESF funded projects.

Students will be trained and REGEA staff will take part in that training via the BUILD2LC project ensuring synergy between different EU funded projects. REGEA will also facilitate some of the meetings with stakeholders and take part in the participative process of developing policy proposals and model for City of Zagreb. The policy proposal and model will build on experience which will students of FER gain by visiting 500 households in Zagreb and providing them with low-cost energy efficiency measures while gathering valuable data on their living habits, energy use patterns and health status. This action will also include dissemination of experience and lessons learned to other local authorities in Croatia and abroad.

3.4.2 Players involved

[City of Zagreb](#), [Society for Sustainable Development Design](#), [University of Zagreb Faculty of Electrical Engineering and Computing](#) and [Regional Energy Agency of Northwest Croatia](#)

- Managing the development of Activity and ensuring its timely implementation

[Regional Energy Agency North](#)

- Sharing lessons learned and best practices in the field of social housing

[Caritas](#) and [Red Cross](#) and Zagreb based NGOs working with vulnerable households (detailed list to be identified at the start of Action's implementing period)

- Providing direct access to vulnerable groups falling out of scope of the current national and local legislation;

3.4.2.1 *Timeframe*

March 2018- September 2020

3.4.2.2 *Costs*

Ca. 1.600.000 HRK (215.000 EUR)

3.4.2.3 Funding sources

European Social Fund, BUILD2LC, City of Zagreb

3.5 Energy Efficiency Obligation of Distributors/Retailers

3.5.1 The background

Under the Energy Efficiency Directive, EU countries must set up an energy efficiency obligation scheme. This scheme requires energy companies to achieve yearly energy savings of 1.5% of annual sales to final consumers. To reach this target, companies need to carry out measures which help final consumers improve energy efficiency. This may include improving the heating system in consumers' homes, installing double glazed windows, or better insulating roofs to reduce energy consumption [12]. In Croatia, the obligations of the distribution system and suppliers are stipulated in the Energy Efficiency Act (OG 127/14) Article 13. Currently, according to the Act, all obligations are brought to distributors although directive states "distributors/retailers".

Article 13 of the Energy Efficiency Act states that distributors of energy are obliged to achieve savings in the final energy use by investing in energy efficiency improvements. Should they fail to achieve those savings they will be facing a penalty. Article 13 also stipulates that ordinance should be adopted which would be defining cumulative goal of savings in the final energy use, alternative measures, criteria for calculation of savings with methodology and prescribe obligatory savings per specific distributor.

Although the Act has been adopted for since year 2014, the needed ordinance/bylaw to regulate obligations set with the Article 13, has not yet been adopted. Thus, there are two important dimensions to be targeted, first one is necessity for development, adoption and implementation of the ordinance/bylaw as Croatia is facing significant risk in not reaching targets set on national level.

Second dimension is directly related to energy poverty as energy savings obligation of retailers/distributors offers opportunity to deliver energy efficiency measures directly to the homes of energy poor. It is important to use this opportunity when the lacking ordinance is to be developed and to impose social criteria.

This action builds on examples shared within the BUILD2LC project such as those discussed during the Gloucestershire visit, RRDA, Poland and LEAG, Slovenia about defining energy poverty, the [Energy Company Obligation \(ECO\)](#) and the Link to Energy Installer network.

This action builds on existing legal obligation which is not being met and while supporting eradication of energy poverty it helps Croatia in achieving its needed energy savings using existing case- studies and lessons learned and shared within the BUILD2LC project.

3.5.2 Players involved

Ministry of environment and energy

- Competent authority for development and implementation of the ordinance/bylaw based on requirements of the Article 13 of the Energy Efficiency Act (OG 127/14)

Ministry of demography, family, youth and social policy

- To be included for development of social criteria and setting of requirements and delivering of the share of obligation at vulnerable households;

Regional Energy Agency of Northwest Croatia

- Facilitating the process and sharing the case studies and lessons learned within the BUILD2LC project; organizing bilateral and multilateral meetings and providing expert insights;

Society for Sustainable Development Design

- Ensuring process is participative providing expert knowledge on energy poverty to ensure quality of the bylaw to be developed;

Retailers and Distributors

- To be involved in the dialogue and participative process;

3.5.3 Timeframe

March 2018 – March 2019

3.5.4 Costs

No extra resources needed. Expected costs will be fully afforded by the existing or planned staff and activities outlined by the participating actors.

3.5.5 Funding sources

BUILD2LC project

3.6 Prosumers and Co-operatives as a tool for tackling energy poverty

3.6.1 The background

In its communication document on state support schemes, European commission states that it is important that beneficiaries sell their electricity directly in the market and are subject to market obligations. Installations with an installed electricity capacity of less than 500 kW or demonstration projects, except for electricity from wind energy where an installed electricity capacity of 3 MW or 3 generation units are excluded [13]. In Croatian legislation feed in tariff is the system in place for supporting renewable energy use (RES) and it is applicable for the RES systems and cogeneration units up to maximum power of 30kW (Article 33 Act on RES and high-efficient cogeneration (100/15, 123/16, 131/17). The law enables investors to have agreements market operators on electricity buy-off entitling them to guaranteed price.

Important component of the law is takeover of the excess electricity production from the buyers which have own electricity production. Electricity suppliers are obliged to take over all excess energy from end buyers (users) which meet the set criteria that at the same location there are buyer and producer and that the maximum connection power of all units does not surpass 500kW and that connective power is not greater than take over (Article 44).

The existing legislation is to certain extent limiting especially to small investors such as private persons. There were few initiatives for changing national legislation in a manner to enable easier access to RES

for private persons and co-operatives some of which were Proposal of the act on citizens' energy from solar power plants form 2015 (rejected) and Proposal for the act on self-supply of electricity from RES which has entered public discussion in January 2018.

There is a need for improvement of legislative in that segment and for easing of access to the electricity market for private persons, small investors and co-operatives. This kind of approach would offer opportunity for those of lesser financial capacity to enter the market as prosumers and it would enable whole communities to have joint investments through forms of co-operatives and set path to decreasing energy costs. *Ending energy poverty hinges on how to enable the poor to access modern energy services in the places where they live* [14]

Energy cooperatives in general, and renewable energy cooperatives especially have great potential for contributing to development and poverty alleviation – not only because by making energy accessible and affordable they can improve productivity and living conditions, but also because they create jobs, including green jobs, particularly in rural areas. In addition, new cooperatives centered on energy generation and distribution could be development hubs for other entrepreneurial activities [14].

This Action builds on discussions held within the BUILD2LC projects and based on REGEA's experience and collaboration with international partners from other Interreg funded projects. This type of innovative approach is likely to play significant role in reducing and tackling energy poverty in future and it is important to set timely steps in start of such actions.

3.6.2 Action

Action will focus on involvement in the current public discussion on the new proposal of the Croatian law on RES in attempt to ensure needed improvements of the legislation and to enable modernization of the system and entry of new players such as co-operatives and private persons as prosumers enabling them with tools to tackle energy poverty.

The first segment will involve detailed analysis of national legislation and of related laws which are already successfully in place in other EU countries. The significant share of analysis will be conducted within the project "Renewable Micro Power Plant Initiative" financed via the Interreg IPA-CBC EU program and it will be supported within the BUILD2 LC project. The results of analysis will be used to facilitate dialogue between key stakeholders and to set path for needed policy improvements and to facilitate final adoption of the needed law.

REGEA will provide expert inputs and sharing the examples of the best cases and will also facilitate needed dialogue on the national level.

The action also includes dissemination activities aimed at motivating public and educating energy poor and their community members on benefits of RES use and introducing them to possible financing models for the initial investment.

3.6.3 Players involved

Ministry of environment and energy

- Competent authority for development and implementation of the Law on RES

Regional Energy Agency of Northwest Croatia, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture in Split, and Society for Sustainable Development Design

- Facilitating the process of law modifications and harmonization with the EU directives rehearsals are met and possible implications to the energy poverty are taken into consideration; Sharing best case examples and lessons learned;

3.6.4 Timeframe

March 2018- September 2020

3.6.5 Costs

N/A

3.6.6 Funding sources

BUILD2LC and RMPPI

3.7 Establishment of FIs on national levels

3.7.1 Background

The experiences, ideas and knowledge about private financial initiative and financial instruments that we get through bilateral meetings with Andalusian Energy Agency (AEA) and The Public Investment and Development Agency of Lithuania (VIPA) organized within the BUILD2LC project in Sevilla (ES) and Vilnius (LT) and Lithuanian good practice “Innovations in Financial instruments” inspired us to create our own solutions for financing energy efficiency projects in Croatia.

Key problem that was present in Lithuania was that mainstream financial institutions such as commercial banks are risk averse and conservative when it comes to long-term financial commitments. Financing periods proposed by banks are too short for the investments in the non-commercial infrastructure (including deep renovation of buildings) both for energy service companies (ESCOs) and public-sector investors. To counter that situation, an Energy Efficiency Fund (ENEF) was established in 2015 by the Ministry of Finance, the Ministry of Energy and VIPA, which was appointed as the manager of ENEF. The Fund implements two financial instruments: loans for financing renovation of central government buildings and guarantees for loans granted by commercial banks for energy efficiency projects. It operates under the program approved by Lithuanian Government which aim is to increase the energy efficiency of public buildings for heating and lighting, to ensure the effective use of the State funds allocated to the improvement of energy efficiency of public buildings, to reduce emission of greenhouse effect gas (CO₂) and to ensure the compliance of central government buildings with hygiene standards.

The domestic and EU legislative framework provided opportunities for the use of financial instruments in the Republic of Croatia, too. However, for efficient and effective use of financial instruments, it is necessary to identify the current obstacles to maximize the use of the existing EU financial perspective and to better prepare for the new EU financial perspective.

EU regulations also provide frameworks for the preparation and implementation of financial instruments for specific areas in the Republic of Croatia. The underlying obligation that precedes any preparation and implementation of financial instruments is the ex-ante assessment of market failure for specific markets. In the area of energy efficiency, sustainable urban development and private-sector investment in RDI in support of innovative and competitive business and research environment, for the

purpose of assessing market failures, in 2015 there was created an analysis "Assessment of potential future use of financial instruments in Croatia; A study in support of the ex-ante evaluation for the deployment of EU funds during the 2014-2020 programming period ". The analysis has been made by *Price Waterhouse Coopers* (PWC) for the European Investment Bank (EIB) and the Ministry of Regional Development and EU Funds of the Republic of Croatia (MRDEUF).

The consulting firm Ernst & Young carried out an independent evaluation (Ernst & Young, 2016) on the effectiveness of the implementation of the European Fund for Strategic Investment (EFSI) for the period from July 2015 to June 2016, which among other reasons cited the reasons for the reduced use of these resources in the new Member States (EU-13) compared to the old Member States (EU-15). Without going into the issue of EFSI's utilization of the EFSU quotas, the focus here is on the reasons of reduced fund use in the newer Member States (EU13) to more efficiently and effectively preparation of domestic entities from the public and private sectors of the Republic of Croatia to use existing financial instruments in the next EU financial perspective since 2021. For this reason, it is considered justified and rational to ask questions: How to make the most of the financial instruments from the current financial perspective? How to be prepare for a new financial perspective? Which instruments are available to us for better exploitation of existing and future EU sources? Moreover, the Government of the Republic of Croatia calls for this document, citing (*inter alia*) that "the state's success in obtaining EFSU support depends on the capacity for project development, experience in work with public-private partnerships (hereinafter referred to as text: PPP), as well as the size of projects and markets". Two other reasons mentioned in the original analysis regarding the inadequate development of the domestic equity market and the competitiveness of ESIF and EFSU sources can be added to this statement.

The following indicates the reasons for the reduced use of financial instruments: competition of ESIF and EFSI sources, reduced capacity to prepare major projects, reduced experience in using the PPP model, Insufficient developed equity financing market and relatively lower capital value of projects.

3.7.2 Actions

3.7.2.1 Defining criteria for determining the FIs structure based on the EE projects in running phase

Within this activity there would be established criteria as a basis for determination of a reliable, i.e. optimal structure of financial instruments for specific projects with a regard to specific risks. In this sense, the types of projects could be divided into industry or sector (industrial buildings, tourist buildings, public buildings, family buildings, public lighting), geographic area (central Croatia, coastal Croatia) and the current state of the building resulting from energy audits. This makes it easier for the criteria to identify the specific risks that depend on the final structure of the total sources of funding. The result of this analysis would be a correction of the structure of possible sources of funding shown in Figure 6.

3.7.2.2 Defining methods for calculating grants and combining grants with financial instruments at the level of a concrete project

This activity logically adds to the previous one (3.7.2.1). After identifying the risks of the EE project, it will be possible to identify (calculate) the required value of the grant with which, with financial instruments, the project could be sustainable in the long run. Also, within the framework of the

implementation of this activity, the results of the EU project, which also set the procedures for combining grants with the ESCO model and financial instruments ("Instruments for Blending European Structural and Investment Funds with Public-Private Partnerships" IPA Allocation Instrument for Croatia: TF/HR-P2-M2-O6-1601).

3.7.2.3 Update ex-ante assessment with new instrument FI UC guarantee

Existing ex-ante assessment of the application of FIs in energy efficiency market in Croatia covers only two proposed financial instruments: loans and equity. Given the imperative of further development of the ESCO market in the Republic of Croatia, it would be of great importance to supplement the existing ex-ante assessment with an additional instrument called Guarantee for regular payment of unitary charge in APM. The risk of charging claims based on the delivered savings service represents a market failure, which by removing significantly increased the likelihood of commercial lenders to finance EE projects delivered by APM (ESCO, EPC).

3.7.3 Players involved

Ministry of regional development and EU funds (MRRFEU)

- Responsible for planning and implementing the regional development policy; improving cross-border, interregional and transnational cooperation and preparation of strategic documents regulating the national development objectives. The Ministry participates in the preparation of priorities and annual and perennial strategic and operational documents for the use of EU funds and other international sources. It sets up priorities for the use of ESI funds available for Croatia and monitors the implementation of measures and activities set out in strategic documents. MRRFEU is responsible for the allocation of FI UC Guarantee (Unitary Charge Guarantee guarantees to ESCO that, if it provides the contracted standard of savings, the contractor will pay the contracted energy service fee).

Ministry of Construction and Physical Planning (MGIPU)

- The Ministry of Construction and Physical Planning performs administrative and other tasks related to construction, physical planning and housing, and participates in the development and implementation of programs from European Union funds and other forms of international assistance in these fields. The Ministry performs administrative and other tasks related to the effects of economic policy instruments and measures on the development of design services in construction and on construction services; operation of legal and natural persons in the field of construction, the Croatian Chamber of Architects and Engineers in Construction and other engineers involved in construction; monitoring and analyzing the quality of construction and design services in construction; housing, housing policy; apartment and settlement construction; implementation of special housing programs of the Government of the Republic of Croatia: policy, monitoring and improvement of the status in utility management, international cooperation in construction and housing. MGIPU gives inputs for the preparation of operational documents for the use of EU funds and other international sources.

Croatian Bank for Reconstruction and Development (HBOR)

- Within the Croatian banking system, HBOR plays the role of a development and export bank established with the objective of financing the reconstruction and development of the Croatian economy. HBOR is responsible for the allocation of FI Guarantee.

Energy service companies (ESCO)

- Implement projects - provide a defined level of energy savings.

Local authorities

- Loan source cash, own sources cash, FI UC Guarantee provider.

Commercial banks (Commercial creditor)

- FI loans.

HAMAG BICRO

- FI guarantee.

3.7.4 Timeframe

2018 - 2020

3.7.5 Costs

Up to 50 million EUR

3.7.6 Funding sources

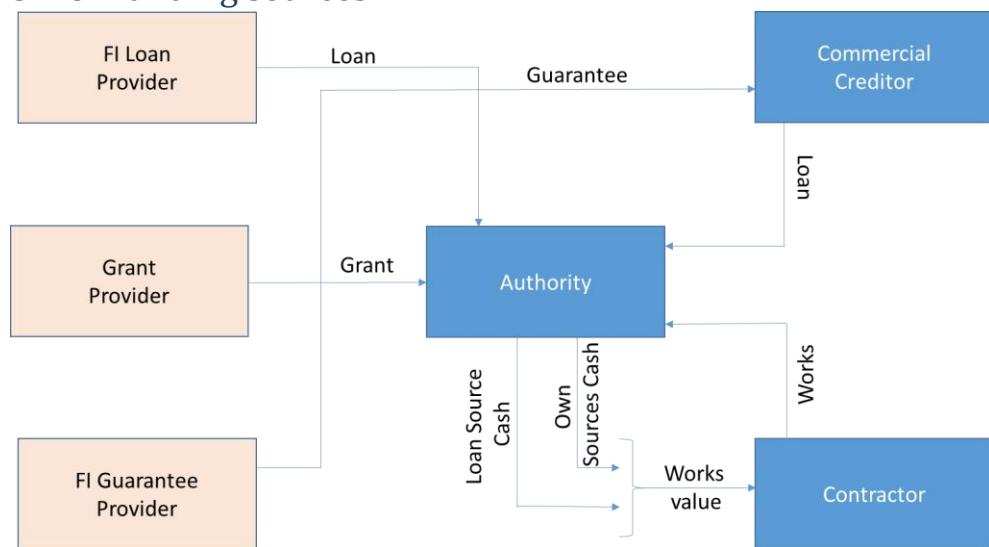


Figure 4 Possible FIs in TPM

When applying the TPM, almost all financial instruments are linked to the customer in a way that he or she is using the loan (FI Loan) or issues a warrant for the granting of a guarantee to the creditor (FI Guarantee).

However, when applying the ATM spectrum of possible instruments is significantly higher. The structure of possible financial instruments is shown in Figure 5:

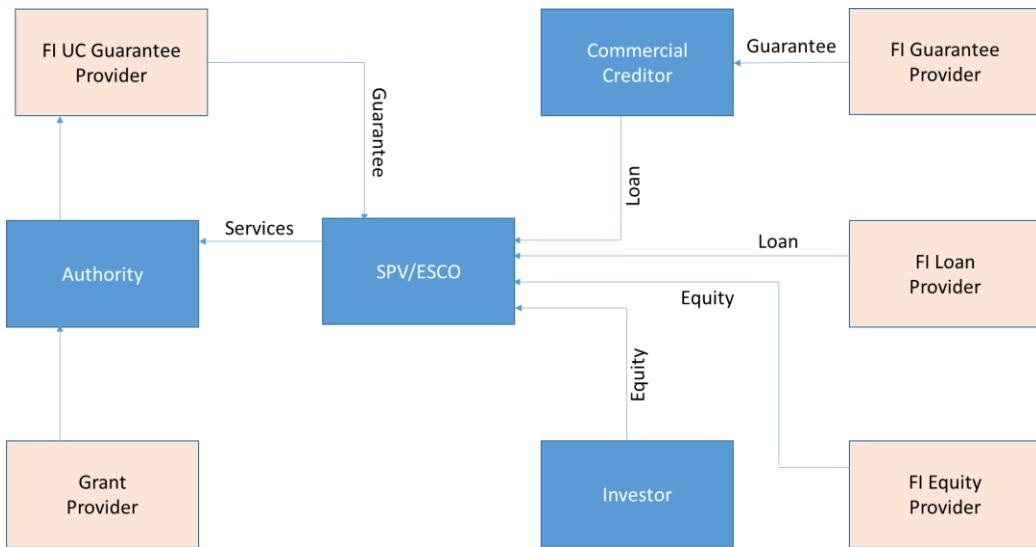


Figure 5 Possible FI's in APM

In the case where an alternative procurement model (APM) is used for the procurement of energy efficiency, then there are instruments connected with the contracting authority and those that are used autonomously by the contractor or the creditor. Thus, for example, the contracting authority may, in addition to the grant, also use the Unitary Charge Guarantee (FI UC Guarantee), which guarantees ESCO that, if it supplies the contracted standard of savings, the contractor will pay the contracted energy service fee. On the other hand, on the side of the executor, there are possible guarantees for a fair refund of FI loans and FI Loan credits. Since the use of an alternative procurement model almost always connects with its own funding sources, the FI Equity instrument could be used in this case.

3.8 Establishment of platform and pipeline of concrete projects

3.8.1 Background

Based on the activities undertaken in the activity 3.7, this project will be able to define project pipeline which can be defined as one bigger pipeline at the level of all the sectors (industry, family households, public buildings, street lighting), but also at the level of an individual sector. A good, transparent and politically supported pipeline is a prerequisite for quick and efficient implementation of projects, their funding and creating a positive climate for investing in EE projects in Croatia. The principles defined in this measure could be a good and especially needed practical example for pipeline design and for other sectors and projects (e.g. education, health, urban transport etc.).

3.8.2 Actions

3.8.2.1 Preparation of pipeline projects with revision of energy audits and introducing a unique system for measuring actual consumption

Implementation of this activity (together with actions 3.7.2.1) is based on energy audits. Namely, the EE project implementation practice has shown that implementation of projects based on energy audits has been very unreliable. This is the case both in buildings and in public lighting. This problem is especially present if the project is delivered by APM. In such cases, contract preparation consultants (PPPs or EPCs)

must periodically review and correct existing energy certificates. Also, the implementation of this activity encompasses the introduction of a unique system for measuring the actual consumption. An important mediating effect is the measurement of the quality of the building (implemented measures of renovation) with a regard to standardized energy consumption. The implementation of this effect can be further developed further through a new project.

3.8.2.2 Establishment of national and local EE investment platforms

Depending on the total value of potential projects as well as geographic structure, local community level (e.g. county) could be defined by investment platforms to define predefined project groups, instructing structures and grants combinations, commercial sources of funding and investor groups and so on. This would significantly accelerate the implementation of EE projects at the local level.

3.8.3 Players involved

Ministry of regional development and EU funds

- Responsible for planning and implementing the regional development policy; improving cross-border, interregional and transnational cooperation and preparation of strategic documents regulating the national development objectives. The Ministry participates in the preparation of priorities and annual and perennial strategic and operational documents for the use of EU funds and other international sources. It sets up priorities for the use of ESI funds available for Croatia and monitors the implementation of measures and activities set out in strategic documents.

Ministry of Constructing and Physical Planning (MGIPU)

- The Ministry of Construction and Physical Planning performs administrative and other tasks related to construction, physical planning and housing, and participates in the development and implementation of programs from European Union funds and other forms of international assistance in these fields. The Ministry performs administrative and other tasks related to the effects of economic policy instruments and measures on the development of design services in construction and on construction services; operation of legal and natural persons in the field of construction, the Croatian Chamber of Architects and Engineers in Construction and other engineers involved in construction; monitoring and analyzing the quality of construction and design services in construction; housing, housing policy; apartment and settlement construction; implementation of special housing programs of the Government of the Republic of Croatia: policy, monitoring and improvement of the status in utility management, international cooperation in construction and housing. MGIPU gives inputs for the preparation of operational documents for the use of EU funds and other international sources.

Croatian Bank for Reconstruction and Development (HBOR)

- Within the Croatian banking system, HBOR plays the role of a development and export bank established with the objective of financing the reconstruction and development of the Croatian economy. HBOR is in charge for managing the FI Guarantee, FI UC guarantee and FI loans.

Energy service companies (ESCo)

- Implement projects - provide a defined level of energy savings.

Commercial banks (Commercial creditor)

- FI loans.

Local authorities

- Loan source cash, own sources cash, FI UC Guarantee provider

HAMAG BICRO

- FI guarantee.

3.8.4 Timeframe

2018-2020

3.8.5 Costs

Up to 5 million EUR

3.8.6 Funding sources

Depending on the total value of potential projects as well as geographic structure, local community level could be defined by investment platforms to define predefined project groups, instructing structures and grants combinations, commercial sources of funding and investor groups and so on. This would significantly accelerate the implementation of EE projects at the local level.

4 Conclusion

Ministry of Regional Development and EU Funds as the Managing Authority for the Operational Program Competitiveness and Cohesion 2014-2020 in Croatia, published the indicative annual plan of calls for proposals for 2018 under the Operational Program Competitiveness and Cohesion 2014-2020¹¹. One of the planned calls is the Call for energy renovation of family houses whose publication is forecasted for 28.6.2019. The representatives of Ministry of Construction and Physical Planning which are responsible for preparation and publication of the Call, actively participated in activities organized within the project BUILD2LC such as regional stakeholder meetings and bilateral meetings. The information and ideas that REGEA presented at the meetings are used in creating measures included in this action plan and in defining the eligibility criteria for the call. Total envisaged budget of this call is 228.000.000 HRK while the value of the budget approved per individual project varies from 20.000 HRK to 200.000 HRK. Based on these data it is evident that number of households with improved energy consumption classification could be maximum 11.400 what is more than nine times the value of the self-defined performance indicator for REGEA in BUILD2LC project which is set to 1.200.

¹¹ <https://strukturnifondovi.hr/indikativni-godisnji-plan-objave-natiecaja/>

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Date: September 2018

Signature: _____

Stamp of the organization: