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CO-EMEP

CO-EMEP – Improvement of cooperation for better energy management and reduction of energy poverty in HU-HR cross-border area

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Analysis of current funding possibilities for energy refurbishment of households in the cross-border area

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1. Introduction

The building sector is facing serious economic, environmental, technical, and social challenges caused mainly by the unprecedent global and regional climate change, overpopulation, intensive urbanisation, excessive use of resources and social inequalities. More than 150 million people in the developed countries cannot afford to cover their basic energy needs while a lot of them live in energy unefficient homes which brings us to the problem of poverty and energy poverty. Eradication of poverty and energy poverty requires the implementation of generous, well-designed housing programs (energy renovation, energy certification and energy audits, changing living habits, awarness rising, etc.) to enhance resilience in the corresponding countries and amortize social inequalities.

Aim of this document is to show financial schemes such as subsidies, loans and incentives which are available for financing energy refurbishment of households in HU-HR cross border area. Energy refurbishment is attached to a number of important benefits for many actors in society. It results in reduced energy bills, increased disposable income and improved indoor comfort levels for households.

In consideration of the European Union's efforts to be resource efficient and climate-neutral, it is evident that positive changes take place in the Member States every year, affecting public and non-profit institutions, small, medium and large enterprises and the general public alike. The main goal of energy efficiency measures is to strive for climate neutrality and the reduction of greenhouse gas emissions. In the analysis, the supporting and financing possibilities available in Croatia and Hungary were examined. This analysis of funding possibilities focuses on the following topics: energy efficiency, climate neutrality, energy poverty, climate change and adaptation, renewable energy sources, energy saving, energy modernization, awareness rising, behavioural change. Short summary materials were prepared for each financial possiblity, which were formulated and compiled in such a way that they could be easily used in the introduction of the funding opportunities or in giving advice regarding the grant.

Energy refurbishment of households stagnates due to many issues, including financial, informational, behavioral, educational and other challenges.

2. General EU framework on funding instruments for energy refurbishment of residential buildings

Improving energy efficiency has a key role to play in achieving carbon neutrality, as buildings in the European Union are responsible for 40% of our energy consumption and 36% of greenhouse gas emissions. On top of reducing emissions of greenhouse gases, home renovations and measures to improve the energy efficiency of homes enhance people's quality of life, improve public health and create additional green jobs in the construction sector. According to the European Commission, only 1% of buildings in the European Union undergo energy-efficient renovation every year. Currently, roughly 75% of buildings in the European Union are not energy efficient. Investment in energy efficiency will also bring additional social and economic benefits to nearly 34 million Europeans who cannot afford to heat their homes properly.

Renovating buildings is essential, and has been singled out in the European Green Deal as a key initiative to drive energy efficiency in the sector and deliver on objectives. In 2020, the European Commission published its strategy to boost renovation in the European Union — a renovation wave for Europe. It pursues a dual ambition of energy gains and economic growth and aims to double annual energy renovation rates in the next ten years. The energy consumption of the buildings and thus the greenhouse emissions increase globally, while the technological progress is unable to compensate for the impact of the main drivers affecting the demand for energy consumption. Renovation of building stock in Europe, as well as in Croatia and Hungary is crucial to alleviate the problem of energy poverty. The achievement of the objectives of the Energy Union especially in the building sector is to be ensured through a combination of initiatives and consistent national policies set out in integrated national energy and climate plans of Member States.

The EU has established a regulatory framework and a set of funding instruments to promote energy efficiency, building renovation and renewables deployment in building sector. To achieve at least 55% emissions reduction target for 2030, proposed by the Commission in September 2020, the EU must reduce buildings' greenhouse gas emissions by 60%, their energy consumption by 14%, and the energy consumption of heating and cooling by 18%.

European Commission has recently published "Renovation Wave", an initiative which aims to reduce greenhouse emissions and energy consumption from building sector. In addition, European Commission aims to at least double renovation rates in the next ten years and make sure renovations lead to higher energy and resource efficiency. The Renovation Wave will improve the places where we work, live and study, while reducing our impact on the environment and providing jobs for thousands of Europeans. The Renovation Wave is not only about making the existing buildings more energy efficient and climate neutral but it also can trigger a large-scale transformation of our cities and built environment. It can be an opportunity to start a forward-looking process to match sustainability with style.

The building sector is expected to undergo a substantial transformation over the next few decades to meet the goals set out by the European Union in relation to the transition towards a clean energy and carbon neutral economy.

To accelerate energy efficiency investments, European Commission has intensified its efforts in recent years, with specific calls to strengthen the existing financial framework, increase funding levels, diversify types of financial models and explore new supporting mechanisms. Various private and public financial and fiscal mechanisms for energy renovations in buildings are currently available in Europe in the form of non-repayable rewards, debt financing, equity financing, etc.

Various private and public financial mechanisms for energy renovations in buildings are currently available in Europe in the form of non-repayable rewards, debt financing, equity financing or a combination of these options. They can range from well-established and traditional mechanisms such as grants, subsidies and loans to emerging and new models not yet well tested in the European market such as crowdfunding and on-bill finance models.

3. Current funding possibilities for energy refurbishment of households in cross-border area

In this chapter current possibilities for financing energy refurbishment of households in the HU-HR cross-area are presented. Despite EU energy efficiency target for 2030 and the transition towards climate-neutral Europe by 2050, actual energy refurbishments which are taking place today neither meet the rate, scale nor the depth aligned with their energy efficiency potential.

3.1. Croatia

When talking about building sector in Croatia, Croatian Government is strongly committed to achieving an energy-efficient and decarbonised building stock by 2050. This document provide examples of financial possibilities for energy refurbismhent of households from both partner countries.

According to available data, family houses make up 65% of the housing stock in Croatia and are responsible for 40% of total energy consumption at the national level. Most of family houses were built before 1987 and they do not have or have only minimal thermal insulation.

Such houses consume 70% energy for heating, cooling and domestic water preparation. Energy refurbishment can significantly reduce their consumption, in some cases up to 60% compared to the current one.

3.1.1. Non-refundable funding instruments

Programme for energy refurbishment of family houses

As already stated before, family houses make up to 65% of the housing stock in Croatia and are responsible for 40% of total energy consumption on national level. Most family houses in Croatia were built before 1987 and have barely any thermal insulation or they only have minimal thermal insulation (energy class E and worse). Houses like this consume 70% of energy for heating, cooling and domestic hot water preparation; energy efficiency measures can significantly reduce their consumption, in some cases up to 60% compared to the current one.

On March 27, 2014, the Government of the Republic of Croatia, (at that time named) Ministry of Construction and Physical Planning and (at that time named) the Ministry of Environmental and Nature Protection adopted the Programme for energy refurbishment of family houses which was implemented by the Environmental Protection and Energy Efficiency Fund (the Fund). The goal of the Programme was to increase the energy efficiency of existing houses, reduce energy consumption and CO_2

emissions into the atmosphere and reduce monthly energy costs, while improving the overall quality of life.

The Programme is an alternative policy measure to achieve part of the mandatory cumulative target of energy savings in final energy consumption. From 2015 to 2021, the Fund published three public calls for energy refurbishment of family houses. The call for energy refurbishment of family houses in 2021 was published on 15th September, and the application process was possible from 7th December, through the information system "ePrijave". The call closed on 14th December 2021, with more than 8400 applications received.

The following activities were co-financed as part of the 2021 public call:

- **complete energy refurbishment** which includes increasement of the thermal protection of the building's envelope through the implementation of at least one thermal insulation measure on the building's envelope and installation of a renewable energy system through the implementation of at least one renewable energy systems measure for the production of energy for heating or heating and cooling (such as wood chips/pellets boiler or pyrolytic wood boiler for heating and preparation of domestic hot water, heat pumps, solar collectors) and/or measure for installing a new photovoltaic power plant for the production of electricity for personal needs, independent (off-grid) or network operated;
- **increasing the thermal protection** of the elements of the building's envelope through implementation of at least one thermal insulation measure on the building's envelope;
- **installation of a renewable energy system** through the implementation of at least one renewable energy systems measure for the production of energy for heating or heating and cooling and/or measure for installing a new photovoltaic power plant for the production of electricity for personal needs, independent (off-grid) or network operated.

This public call was intended for persons – citizens, owners or co-owners of family houses with residency at the address of the family house. Citizens could apply for this public call for their family houses if their houses were in energy class C or worse in coastal Croatia or D or worse class in continental Croatia, for activities of complete energy refurbishment and increasing the thermal protection.

For activities of installing a renewable energy system, the family house had to be C or better energy class in continental Croatia or B or better energy class in coastal Croatia.

The beneficiaries of the Fund's grants are obligated to keep their residence at the address of the house – subject of co-financing, for two years from the date of the Fund's grants payment.

Grants under this public call are awarded through donations, with possible co-financing per family house as follows:

- up to 60% of eligible costs, a maximum of 204,000.00 HRK – for complete energy refurbishment;
- up to 60% of eligible costs, a maximum of 120,000.00 HRK – for increasement of thermal protection;
- for installation of renewable energy systems:
- up to 80% of eligible costs, a maximum of 73,000.00 HRK in areas of special state concern and first group of islands,
- up to 60% of eligible costs, a maximum of 54,750.00 HRK in hilly mountainous areas and second groups of islands,
- up to 40% of eligible costs, a maximum of 36,500.00 HRK in other areas of the Republic of Croatia.

The total available grants under the public call amounted to 390 million HRK. The aim of the 2021 public call was to increase the number of energy refurbished family houses in Croatia. It is estimated that about 5200 family houses will be refurbished through this public call. The expected effects of the implementation of this public call are annual energy savings of 0,37 PJ and reduction of CO_2 emissions of 12.958,00 tCO_2.

Incentives of local government units

In Medjimurje county, several local government units (LGU) awarded incentives in the last few years to their residents through public calls for:

- purchase of existing houses and/or house reconstruction and adaptation;
- demolition of old houses and building new houses on the same property;
- building new houses;
- façade renovation (painting of façades);
- subsidising housing loans for young families.

Towns Mursko Središće and Prelog have issued public calls for their residents in the past years, as well as municipalities Belica, Donja Dubrava, Donji Kraljevec, Donji Vidovec, Goričan, Kotoriba, Mala Subotica, Orehovica, Štrigova and Vratišinec. In order to be successful with the application, the applicants/residents must comply with the conditions set by their LGUs. For example, some local LGUs give incentives to people younger than 40 or 45 years of age, currently permanently employed in Croatia, with a residency on the territory of the LGU. Other than mentioned, LGUs set conditions the applicants must meet after they are granted the incentive – most are related to how long they must have a residence at the house – subject of the application, after the incentive pay-out.

Incentives are awarded in different amounts for various measures – between 10.000,00 and 30.000,00 HRK is granted to applicants for purchasing existing houses and/or house reconstruction and adaptation, demolition of old houses and building new

houses on the same property or building new houses, and between 3.000,00 and 15.000,00 HRK for façade renovation (painting of façades) – only available in municipality of Kotoriba.

The Town of Prelog subsidises housing loans to young families from the area of the Town of Prelog. Applicants can be granted a total amount of 25.000,00 HRK in subsidised interest rates for housing loans for the period of five years. Additional subsidising is possible if the applicant has a minor child, adopted child or a child assigned to his care or if the applicant or a member of his household is a person with disabilities. This housing loan subsidising cannot be combined with the housing credit subsidy programme mentioned in the next section.

3.1.2. Refundable and combined instruments

Housing Credit Subsidy Programme

Housing Credit Subsidy Programme is a measure of assistance from the Government of the Republic of Croatia which facilitates housing for Croatian citizens by repaying part of the housing credit. Subsidy conditions are regulated by the Housing Loan Subsidy Act (OG 65/17, 61/18, 66/19 and 146/2020) and the Instruction on the Procedure of the Agency for Legal Transactions and Real Estate Brokerage in the implementation of the Subsidising housing loans Act (OG 76/17).

Amendments to the Act published on 28 December 2020 enabled further subsidies for housing loans for young people until 31 December 2023, for each calendar or budget year. The Agency for Legal Transactions and Real Estate Brokerage (APN) issues a public invitation to credit institutions (banks) that wish to participate in the implementation of the law. Banks offer interests rates and after their selection, contracts are signed between banks and the Republic of Croatia. After this process, APN issues a public call for citizens.

Applications for housing loan subsidies are submitted by citizens residing in the Republic of Croatia, who meet the conditions for obtaining a housing loan determined by a bank:

- not older than 45 years;
- the applicant or his spouse or common-law partner, life partner or informal life partner, does not own any apartment or house (real estate) or owns only one apartment or house that he sells to buy a larger apartment or house or build a house for the needs of his own housing.

The subsidising lasts five years and, with it being a demographic measure, the deadline can be extended by additional two years for each live-born or adopted child and if the applicant or a member of his household has a disability with a physical impairment of 50% or more. Also, the subsidising can be extended by an additional year for every child, member of the applicants' household, not older than 18 years.

Loan subsidies are intended for the purchase of an apartment or house, construction of a house up to a maximum of 1.500,00 EUR per square meter in HRK equivalent, or up to a maximum loan amount of 100.000,00 EUR in HRK equivalent and with repayment period not shorter than 15 years.

The amount of the subsidy depends on the development index of the location where the real estate is bought or built, and ranges from 30 to 51 percent of the loan instalment. The biggest subsidises go to those who buy an apartment or house or build a house in the least developed areas, while 30 percent goes to those who decide to buy or build real estate in urban centres such as Čakovec in Međimurje county.

Since the beginning of this measure's implementation, more precisely since 2017, over 22000 subsidies have been approved, for which more than 456.7 million HRK has been paid from the state budget.

According to current data, approximately 5000 children were born during this period, what entitles the applicants to additional subsidies for their loans (two years per born child).

Applications for the last, sixth in a row, public call for subsidised housing loans were possible in the period from March 29, 2021 to May 14, 2021, through which 4,739 applications were received, and 4,648 were approved. The average amount of the subsidised loan was 75.000,00 EUR; the average repayment period of the beneficiary is 22 years, while the average age of the beneficiary was 32 years.

The amount of the average monthly annuity is about 378,00 EUR or 2.830,00 HRK, of which the monthly subsidy is about 125,00 EUR or 940,00 HRK.

Commercial banks – green loans

In addition to usual housing loans, commercial banks in Croatia also offer green housing loans to citizens, intended for investing in green construction and increasing the energy efficiency of residential real estate.

Green credit can be granted for:

- purchase of a house or apartment or (re)construction of low-energy residential real estate of energy class A +, A and B;
- increasing the energy efficiency of residential real estate (installation of thermal facades, roof replacement, installation of exterior carpentry, installation of renewable energy systems - heat pump system, solar systems, etc.).

Banks offer various types of green loans, which enable the purchase of housing with high energy efficiency, construction, extension and reconstruction of high-energy houses, purchase and installation of equipment for renewable energy systems, real estate interventions that reduce energy consumption, thermal insulation of residential buildings and similar.

In order for houses to be energy classes A+, A and B, they must be build or reconstructed by adhering the nearly zero-energy building (nZEB) standard. An nZEB building is a building with very high energy properties. It uses very low amounts of energy, which is largely obtained from renewable energy sources, including energy produced on or near the building.

Some characteristics of nZEB buildings that make them energy efficient are:

- contributing to the preservation of climate and uses renewable energy sources (sun, water, soil, air ...) for its energy needs;
- at least 30% of the annual energy is produced from renewable energy sources, preferably on or near the building;
- containing energy-efficient systems for heating/cooling of fresh/filtered air without external pollutants, dust and allergens, with exceptional air comfort, and therefore no health problems or need for frequent cleaning;
- using smart technologies for the management of technical building systems, ie building automation and management, adjustment and monitoring, for technical systems or their parts;
- requiring less maintenance and has a longer service life than others, because building materials and devices are more carefully selected and installed;
- using energy efficient energy consumers (appliances and lighting).

3.1.3. Innovative and alternative instruments

PVMax project

One of five Croatian energy agencies, North West Croatia Regional Energy Agency (REGEA) based in Croatia's capital Zagreb, is currently implementing a project named PVMax. The project aims at preparing and launching investments of at least 100 MW of integrated photovoltaic power plants on the territory of the Republic of Croatia. The PVMax project is co-financed by the Horizon 2020 program implemented by the European Commission through the ELENA program. ELENA - European Local ENergy Assistance is a joint initiative of the European Investment Bank (EIB) and the European Commission implemented within the Horizon 2020 program.

In order to achieved the set goals, in 2021 REGEA published a public call for grants in form of technical assistance intended for legal entities (owners of buildings where integrated photovoltaic power plant are planned) in public and private sectors throughout Croatia. A similar public call is expected to be published in 2022 for individuals (natural persons).

Technical assistance provided by the PVMax project includes preparatory activities in terms of technical and legal advice as well as financial consulting. For example, technical assistance includes cost-effectiveness analysis, technical analysis of optimal

power of photovoltaic power plants, technical documentation to verify the possibility and costs of connecting photovoltaic power plants, preparation of contractual documentation for photovoltaic power plants design and construction, development of minimum technical specifications on procurement, analysis of available financing sources.

Technical assistance, awarded through this public call, is free of charge for the applicants. However, the project does not provide funds to finance capital investments, it only provides technical assistance for project preparation.

Citizen energy community

According to Croatian Electricity Market Law (OG 111/2021), citizen energy community (CEC) is a legal entity established on the territory of the Republic of Croatia, whose shareholders or members voluntarily unite in order to achieve the benefits of energy exchange produced and consumed in a certain area of the local community. It operates by adhering to laws governing financial operations of non-profit organisations, while it performs its energy activities (business) on the basis of a licence issued in accordance with the law governing the energy sector. Shareholders or members can be natural persons or legal entities, including LSGU's, micro or small enterprises with place of residence or establishment on the territory of the LSGU where CEC's residency is. A single shareholder or member can have a maximum of 40% of shares in the CEC.

The CEC can participate in the production of electricity for the needs of its shareholders or members from renewable energy sources, among other things, as well as participate in supply electricity, manage consumption, store energy, aggregate, energy efficiency services, charging services for electric vehicles for its shareholders or members and other energy services for its shareholders or members of the CEC in accordance with the rules governing electricity markets.

The CEC can participate in all electricity markets directly or through aggregation in accordance with the rules governing individual electricity markets.

Energy from the CEC can also improve energy efficiency at household level, which in turn helps prevent energy poverty by reducing consumption and lower supply tariffs. This is a fairly new concept in Croatia, only in its beginning and there aren't examples about implemented CEC's.

Crowdfunding

Crowdfunding is an alternative instrument for providing capital invested by citizens. It is a process in which the public is asked for financial support to start a (creative) project or business. The process takes place online via specialised web platforms, with a goal to involve a great number of people with different motivational factors. Cumulatively, small payments lead to a significant amount sufficient for the realisation of a project or

business. Crowdfunding is also transparent because the donators can see how much funding is raised at a given moment and, most of the time, see who donated what amount.

In order to have a successful crowdfunding campaign, motivating donators is very important. There are four types of crowdfunding models based on perks project owners offer to the donators:

- Donation model – donators donate money without a perk in return (mostly used in charity campaigns)
- Rewards model – perks/rewards in form of products or services for donators
- Loans model – micro loans with a return rate for donators
- Shareholding model – only for legal entities; donators become co-owners of the business they invest in

Even though this alternative instrument isn't meant for financing energy refurbishment of private households, it can help finance energy projects for public buildings. For example, the town of Križevci in Koprivnica-Križevci county (bordering Međimurje county) funded a photovoltaic power plant on the roof of the city library, through a crowdfunding campaign. It was funded by a loans model, where donators/investors would loan money to the project owner with a 3% interest over a 10 year period.

Grants form EU projects and national ministries

The project such as this can allow to plan and implement energy refurbishment investments in households and other small energy efficiency measures such as energy certification and directly enable the home owners to receive EU funding through energy agencies and other institutions in the field of energy. Through CO-EMEP project, five family houses in Medjimurje County and five familiy houses in Zala County were included in the implementation of pilot actions which include conduction of energy audits, preparation of energy certificates and implementation of basic construction characteristics measurements (thermographic imaging, blower door testing, heat transfer coefficient measurement). Energy certificates prepared through this project can be used for applying for new tenders of the Environemtal Protection and Energy Efficiency Fund, or other national bodies and housing loan subsdy programs through assitance measures of national governments, applications to calls published by local governments that want to encourage young people to stay in their area, and loans from commercial banks – "green loans", which require the applicant to have an energy certificate.

There are several EU funds or incentives from national ministries, through whose projects, as project activities applicants can find different ways of financing the energy refurbishment of their family houses. Participating in such EU-funded projects for house holderes brings benefits in terms of providing the necessary certificates for

energy refurbishment and even direct financial benefits, in terms of providing financial resources for the implementation of refurbishment measures.

3.2. Hungary

3.2.1. Non-refundable funding instruments

Solar systems and electrification of heating systems in combination with solar systems

The main goal of the RRF-6.2.1 call is to implement building energy modernizations that results in energy savings and reduction of CO_2 emissions.

Eligible applicants: private persons are eligible who owns or co-owns the property affected by the investment and meets the income requirements, e.g. the amount of annual income per capita in the given household is less than 4.850.000 HUF.

Eligible activities: within the framework of the call, the application may be submitted for a family house (with a separate heating system and built for permanent housing) for one of the following two technical contents:

- Case 1: Installation of a solar system on the roof including an inverter (with a maximum capacity of 5 kW, max. 20% difference is possible if it is justified), a roof-mounted structure and the installation of the system.
- Case 2: Installation of a solar system on the roof, including the electrification of the heating system with air-to-air or air-to-water heat pump with heating capacity of 12 kW maximum, installation of electricity storage (storage capacity of 14 kWh maximum), replacement of doors and windows, the inverter (with a maximum capacity of 5 kW, max. 20% difference is possible if it is justified)

Eligible costs are: material and labour costs, costs related to the planning of the investment, energy planning, cost of permissions, publicity, energy certificate.

Technical conditions: the total capacity of installed solar panels may exceed the capacity of the inverters by up to 20%.

Conditions for heat pumps:

- Air-to-air heat pumps are eligible if the seasonal CoP (SCoP) at +2 °C outdoor and +20 °C indoor temperature meets the following conditions: the SCOP is at least 4.1 up to declared capacity for heating of 6 kW, the SCOP is at least 3.8 above the declared capacity for heating: of 6.1 kW,
- Air-to-water heat pumps are eligible if the COP value is at least 4.2 at the outdoor temperature of +7 °C and a heating water temperature of 30/35 degrees.

In case 2, the energy storage device and the solar energy storage system have to meet the following minimum technical conditions:

- having own battery management system (BMS);
- a minimum service life of 10 years or 6,000 charging cycles;
- modular design;
- the system including the inverter has to be able to receive and execute an external control signal.

Amount of contribution: minimum 500.000 HUF and maximum 2.900.000 HUF in case 1 and maximum 11.300.000 HUF in case 2. Rate and type of contribution: 100%, non-refundable

Home renovation subsidies according to the 518/2020. (XI. 25.) Government Decree

The basic aim of the construction is to improve the housing conditions of families who bring up children and to white the construction sector. Contribution for the use of renewable energy sources (solar collector, installation and replacement of a solar system, expansion of an existing solar system) can be funded within this call.

Eligible applicants: Hungarian citizens or people have right of residence in Hungary, and having at least one child or bring up a child under the age of 25.

Eligible activities: the contribution is for the renovation and reconstruction of the property located in Hungary, registered in the land registration system as flat or family house.

Amount of the contribution and funding rate: maximum 50% of renovation costs, but maximum 3.000.000 HUF, the rate of material and labour fees: 25-25%. In case of installation of a solar system, the total material and labour costs may not exceed the gross amount of 450.000 HUF / kWp. Form of the contribution: non-refundable.

3.2.2. Refundable and combined instruments

Loan to increase energy efficiency and encourage the renewable energy utilization

The main objective of the loan program (GINOP-8.4.1/A-17 and VEKOP-5.2.1-17) is to provide funds for building energy investments in order to improve energy efficiency and encourage and use of renewable energy sources. Two calls were published, one is for the Central Hungary region (HU1 region including Pest county and Budapest), and the other call was published for applicants outside the Central Hungary region.

Eligible applicants: private persons (Hungarian citizens or persons who have right of residence in Hungary for at least one year) and condominiums and housing cooperatives are eligible to apply for the loan.

Eligible activities: the loan can be used for investments and equipment aimed at increasing energy efficiency, as well as for the installation of renewable energy sources:

- Thermal insulation of building boundary structures.
- Replacement and energy-saving modernization of building boundary structures and doors and windows.
- Improving the summer heat protection of buildings, installing shading structures.
- Modernization of heating and domestic hot water systems: modernization and replacement of heat generation equipment (e.g. installation of condensing boilers), modernization or replacement of heating equipment, chimney technique improvements.
- Upgrading of the heat recovery equipment.
- Energy-saving conversion of existing indoor and outdoor lighting systems: replacement of light sources, luminaires (excluding wires and switches), upgrading of lighting systems and related technical solutions.
- Installation of solar system for domestic hot water demand and heating
- Construction of boiler system for heating and domestic hot water (briquettes, pellets, wood chips, wood gasification system).
- Installation of solar system for electricity generation.
- Ground source, water-to-water, air-to-water heat pump systems for heating and cooling and domestic hot water production.

Amount of the contribution and funding rate:

- private persons: maximum 90%, minimum 500.000 HUF, maximum 5 million HUF.
- condominiums and housing cooperatives: the minimum contribution is 250.000 HUF per flat, the maximum amount is 7 million HUF.

The loan interest is 0%, repayment: monthly.

3.2.3. Innovative and alternative instruments

H-tariff

Tariff H is a discounted electricity tariff which was introduced for the lower cost operation of heat pumps and heating systems based on renewable energy sources. It can also be requested for residential use. The tariff can be used in the period between October 15 and April 15. (The capacity is available outside the period but at other, higher price).

Small household-size power plants

In the case of small household-size power plants, the electrical energy trader or the public service provider sells electricity is obliged to take over the unused part of the electricity produced from renewable energy. Household-size power plant is considered to connect to a low-voltage network and have a capacity of not more than 50 kVA. If the electricity produced is greater than the use, the surplus energy flows into the public network through the connection point.

Aid-type grants

Housing allowance: municipalities may offer special allowance for socially deprived households if it is difficult or impossible to pay for regular housing expenses (electricity, water, natural gas, fuel, etc.). Amount of the allowance: 30% of the cost of the maintenance.

Support for social fuel: support for local governments to buy firewood and coal to reduce the household fuel costs

4. Conclusion and final remarks

The building sector is a significant contributor to greenhouse gas emissions in Europe, and needs to be tackled in order to reach our climate obligations under the Paris agreement. However, numerous barriers in knowledge, awareness, trust, finance and market development mean that renovation rates of private households remain low, and of limited impact. The buildings sector is lagging behind the EU's climate and energy targets. Progress in energy savings has been limited. Only 1% of the EU building stock undergoes each year a renovation that has a significant impact on energy performance.

The quite slow progress and the shy implementation of decarbonization policies mainly in the developed countries is far from adequate. Future building developments should be green, sustainable, and designed to promote benefits of the future growth for the whole population as much as possible. It is a global effort asking for radical technological, financial, social and cultural adaptations to a new reality that unfortunately is not yet well known.

This document has shown that EU Member States – Croatia and Hungary, currently deploy various public support instrument. These are primarily in the form of grants/subsidies, followed by soft loans and tax incentives which target residential, commercial and public buildings.

Financial mechanisms for energy refurbishment of households may take the form of non-refundable funding instruments or refundable and combined instruments. They can range from well-established and traditional mechanisms such as grants, subsidies and loans.

Financing solutions for low-income households for cost neutrality must address rents, energy and operating costs and local taxes through the use of grants, subsidised renovation measures or the use of energy savings for repayment (limiting upfront investment to available grants). Such solutions can be deployed alongside micro-credits backed by a guarantee fund to promote fair cost-sharing between owners and tenants, on-bill financing schemes and on-tax financing schemes. Vulnerable households must be shielded from rent increases that may follow renovations.

In accordance with the Clean Energy for All Europeans Package, Member States must use their National Energy and Climate Plans and Long-Term Renovation Strategies to identify dwellings of people at risk of energy poverty and develop effective strategies for renovating. The Paris Agreement goals require net-zero CO_2 emissions by mid-century. The European Commission in its recent proposal for climate and energy strategy for 2050 indicated the need for more intensified actions to substantially improve the energy performances of buildings. With the rate of new construction in Europe, the challenge is to increase both the pace and depth of building energy renovations. Several barriers inhibit the wide uptake of comprehensive energy renovations, including financial difficulties.

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