



Analysis of energy poverty in the Republic of Croatia

Dubravka Maras*, Andrea Babić**

Abstract: For a long time, energy has been a fundamental element of human growth and development. However, despite all technological progress and information development, many people in the world still do not have consistent access to at least one form of energy. This is where the concept of energy poverty appears. Energy poverty is generally defined as a situation in which households do not have enough disposable income to pay the bills for the energy needed in their household. The main factors that influence the appearance of energy poverty are primarily insufficient household incomes, the energy prices and their availability in a particular area, and the quality of housing units. This paper tries to show what the situation is in the Republic of Croatia and how to approach solving this problem. In the Republic of Croatia, this problem is tried to be solved by defining the vulnerable energy buyers, which places energy poverty in social policy, and accordingly, measures are most often implemented in the form of financial benefits (it is equated with energy poverty). What is missing here is the important connection between energy and social policy.

*mr. sc., MBA, University of
Applied Sciences Baltazar
Zaprešić, Croatia,
dmaras@bak.hr

**mag. oec., Croatian Energy
Regulatory Agency (HERA),
Croatia,
babicandrea22@gmail.com

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Analiza energetske revščine v Republiki Hrvaški

Povzetek: Energija je že dolgo temeljni element človeške rasti in razvoja. Vendar kljub vsemu tehnološkemu napredku in razvoju informacij veliko ljudi na svetu še vedno nima doslednega dostopa do vsaj ene oblike energije. Tu se pojavi koncept energetske revščine. Energetska revščina je na splošno opredeljena kot stanje, v katerem gospodinjstva nimajo dovolj razpoložljivega dohodka za plačilo računov za energijo, ki jo gospodinjstvo potrebuje. Glavni dejavniki, ki vplivajo na pojav energetske revščine, so predvsem nezadostni dohodki gospodinjstev, cene energentov in njihova razpoložljivost na posameznem območju ter kakovost stanovanjskih enot. Ta prispevek poskuša pokazati, kakšno je stanje v Republiki Hrvaški in kako pristopiti k reševanju tega problema. V Republiki Hrvaški se ta problem poskuša rešiti z opredelitvijo ranljivih kupcev energije, kar umešča energetske revščine v socialno politiko, zato se najpogosteje izvajajo ukrepi v obliki finančnih ugodnosti (enači se z energetske revščine). Kar manjka, je pomembna povezava med energetske in socialno politiko.

Ključne besede: revščina, energija, politika, državni ukrepi

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INTRODUCTION

Energy security is considered one of the main components of the stability of the economy and the national security of the state, therefore the main task of all who share public responsibility for economic policy and economic development is to ensure sufficient energy for all citizens. Today, energy represents one of the basic needs of all people and every household. The current energy crisis has put the demand for energy at the center of attention. All over the world, energy prices are continuously rising, and unfortunately, this trend could continue to rise in the future. The energy crisis we are currently dealing with has brought with it a wave of problems that households around the world are increasingly struggling to cope with. Therefore, the concept of energy poverty is being mentioned more and more in the world. As the European Union has recognized the problem for many years, it approaches measures and recommendations to reduce it by adopting Regulations and Directives warning of the growing problem and requiring its member states to draw up action plans. Accordingly, in 2012, the Republic of Croatia (hereinafter referred to as Croatia) introduced the concept of an endangered buyer of energy from the household category into its legislation and prescribed the adoption of a Regulation determining the position and status of an endangered buyer. This Decree was later passed in 2015, and it determined financial aid for the most vulnerable citizens. However, the problem is much broader and includes an increasing number of households and does not only refer to one who's the most socially vulnerable.

This work is based on the analysis of energy poverty in Croatia within the framework of the welfare economy, which represents the area of state interventions aimed at increasing the well-being of the population through the fight against poverty and income redistribution.

1 National legislation

Croatia most often adopts and changes its regulations to harmonize them with the *acquis* of the European Union. For this reason, there are certain regulations and strategies that try to help vulnerable citizens. In the following, the most important regulations relevant to energy poverty in Croatia are determined, and it is important to list these regulations and describe their significance for combating energy poverty to gain an insight into what the state is doing with them in this context, and thus an important presentation in national legislation regulating energy and social issues.

Some of the most significant regulations governing the energy sector in Croatia, which are relevant to energy poverty (according to the authors of this paper), are:

- Energy development strategy of the Republic of Croatia until 2030 with a view to 2050. (NN 25/2020)¹ - This strategy has been in force since 2019., and it emphasizes the extremely important role of increasing energy efficiency to reduce energy costs and thereby alleviate energy poverty. The strategy states that by increasing energy efficiency, benefits for the environment will be realized, greenhouse gas emissions will be reduced, energy security will be improved, energy costs will be reduced, and energy poverty will be alleviated. This will lead to greater competitiveness, increased employment, and increased economic activity, which will improve the

¹ Energy development strategy of the Republic of Croatia until 2030 with a view to 2050. NN 25/2020. https://narodne-novine.nn.hr/clanci/sluzbeni/2020_03_25_602.html

quality of life for citizens. It highlights the need to implement the Program for the Suppression of Energy Poverty to implement certain measures and effectively reduce energy poverty.

- Social Welfare Act (NN 18/22, 46/22, 119/22, 71/23, 156/23)² - This law prescribes the right to compensation for a vulnerable buyer of energy and recognizes a single person or a household that meets the conditions for acquiring the status of a vulnerable buyer, as prescribed by the regulations governing the energy sector (Article 43 of the Social Welfare Act). The monthly amount of compensation as well as the procedures of the competent centers are prescribed by the Regulation on the monthly amount of compensation for vulnerable energy buyers, the method of participating in the payment of energy costs of the beneficiaries of the compensation, and the actions of the Croatian Institute for Social Work. The law also prescribes compensation for the cost of firewood, one-time compensation, and a guaranteed minimum compensation for the cost of housing, which includes electricity, gas, heating, water, rent and other housing costs. According to the provisions of this law, the fee for an endangered buyer of energy products amounts to 26.54 euros today, and exceptionally up to a maximum of 70 euros.
- Act on Energy Efficiency (NN 127/14, 116/18, 25/20, 32/21, 41/21)³ - this law emphasizes the obligation of energy suppliers to encourage the implementation of energy efficiency measures, especially for households affected by energy poverty or in social housing. All measures, that is, all activities that would be carried out should be carried out in a way that will contribute to reduced energy consumption and energy savings, respecting the principle of energy efficiency first. Article 13, paragraph 11 of the Law on Energy Efficiency emphasizes that one of the obligations is to encourage an increase in energy efficiency, primarily for households that are at risk of energy poverty.
- Energy Act (NN 120/12, 14/14, 102/15, 68/18)⁴ - this law also recognizes the possible occurrence of energy poverty through the concept of a vulnerable customer. The law defines it as "a consumer of energy from the household category who, due to his social position and/or health condition, has the right to supply energy under special conditions" (Article 3(34) of the Energy Act). An endangered customer acquires its endangered status when it is supplied through the mandatory public service of supplying gas, thermal energy to tariff customers, or within the framework of the universal service, if persons living in such a household have been determined by the authorities responsible for social issues to be in an endangered social status and the need for this form of social assistance and persons diagnosed with a certain degree of disability, persons with special needs or persons in poor health whose life or health may be endangered due to the restriction or suspension of energy supply.

2 Analysis of the case of energy poverty in the Republic of Croatia

Although energy poverty isn't specifically defined in Croatia, it is mentioned as an issue and efforts are made to find a solution in several laws and publications. This is one of the key ideas behind energy poverty since Croatia has long acknowledged the vulnerable consumer of energy products. The poverty risk rate in Croatia was 19.5% in 2021, but it has already dropped to 18% in 2022. According to the most recent data available from the National

² Social Welfare Act. NN 18/22, 46/22, 119/22, 71/23, 156/23. <https://www.zakon.hr/z/222/Zakon-o-socijalnoj-skrbi>

³ Act on Energy Efficiency. NN 127/14, 116/18, 25/20, 32/21, 41/21. <https://www.zakon.hr/z/747/Zakon-o-energetskoj-u%C4%8Dinkovitosti> (29.03.2023.)

⁴ Energy Act. NN 120/12, 14/14, 102/15, 68/18. <https://www.zakon.hr/z/368/Zakon-o-energiji>

Bureau of Statistics, up to 7% of households struggle to make ends meet, and up to 15.7% of people who experience financial difficulties also struggle to pay their power bills (National Bureau of Statistics, 2022.). To protect citizens from inflation and rising energy prices, the Government of the Republic of Croatia provided more funds from the budget this year. It was announced that there are 69,000 vulnerable energy buyers in Croatia, and this year their compensation amounted to 70 euros. The concept of a vulnerable buyer of energy in Croatia refers to the most vulnerable citizens, who, due to their characteristics, are more likely to be energy poor than other citizens. The Croatian legislation classifies such citizens as vulnerable groups of generally poor citizens, and the reason for this is that no analyses are made based on which it would be possible to determine exactly which citizens are energy poor. Vulnerable groups certainly statistically have the highest chance of being energy poor. As for energy-efficient households in Croatia, according to the Energy Renewal Program, multi-apartment buildings represent about 35% of the total housing stock in Croatia, and that percentage is 27% of the total building stock. The program considers that a total of 6.3 million m² should be renovated by 2030. (Ministry of Physical Planning, Construction and State Assets, 2023.). In Croatia, the real measures aimed at suppressing energy poverty only appeared around the beginning of 2021, based on the National Energy Efficiency Action Plan, and even these measures have not been fully implemented until today. However, energy and social policies are still trying to achieve certain results. To present the state of energy poverty in Croatia in more detail, below is an explanation of the causes of energy poverty and how they are visible in Croatia.

2.1 Low income

The State Bureau of Statistics regularly conducts Surveys on the income of the population, on which the calculation of indicators of poverty and social exclusion for the Republic of Croatia is based. According to the data from that survey, in 2021 there were 5.7% of people living in households that could not afford adequate heating in the coldest months, and as many as 16.6% of people living in households that were late due to financial difficulties in the last 12 months with payment of obligations (housing loan, rent, utility bill or consumer loan). The at-risk-of-poverty rate is a standard indicator that measures the percentage of people whose equivalent disposable income is below the at-risk-of-poverty threshold. According to the survey data, the poverty risk rate in 2021 was 19.2%, while according to the indicator of people who are at risk of poverty, in severe deprivation, or live in households with low work intensity, the poverty risk rate is even 20.9%.

Table 1. Indicators of material deprivation in 2021

	Republic of Croatia	Pannonian Croatia	Adriatic Croatia	City of Zagreb	Northern Croatia
Poverty risk rate	19,2	27,0	18,1	11,6	18,5
People at risk of poverty or social exclusion.	20,9	28,6	19,9	13,3	19,8

Source: Bureau of Statistics, <https://podaci.dzs.hr/2022/hr/29178> (20.03.2023.)

As for 2022, those percentages are slightly lower, but still not significant. The poverty risk rate last year was 18%, which means only 1.2% less compared to 2021. Also, the percentage of people who are at risk of poverty is slightly lower, but only by 1%, which means that this

rate for 2022 was 19.9%. The data for the year 2023 is of course not yet available, but if the trend of the risk rate decline continues, the situation could get better. We should not forget that these percentages are still among the highest in Europe.

As income is considered the basic indicator of poverty in general, it is important to note that its rate does not show how exactly a person is poor, but how many people have an income that is below the poverty risk threshold, which is set at 60% of the mean value of the equivalent disposable income of all persons. According to State Bureau of Statistics, the rate of risk of poverty in Croatia for the year 2022 was about 5,250.00 euros (39,600.00 HRK) per year for a one-person household, while for two people with two children under 14 it was about 11,000.00 EUR (83,160.00 HRK) per year. This leads to the data that 19.9% of people in Croatia are at risk of poverty, and therefore also at risk of energy poverty. The percentage of those who are in severe material and social deprivation is 4%.

2.2 High energy prices

The fact that high energy prices are a problem for many households in Croatia is well demonstrated by Table 2, which shows how many households in Croatia had problems paying for electricity. The table shows the number of households whose electricity was disconnected due to non-payment of bills. Although in 2019 the number of electricity outages increased significantly compared to the previous year, we see that in 2020 the number dropped considerably, but the number did not decrease significantly in the following year either and that trend continued during 2021.

Table 2. Indicators of the number of temporary suspensions of power supply due to non-payment of electricity in the Republic of Croatia from 2017 to 2022 for the household consumption category

Indicator	2017.	2018.	2019.	2020.	2021.	2022.
Number of temporary suspensions of power due to non-payment	17.444	12.896	33.765	22.217	22.365	20.481

Source: Work based on data from the Annual Report of HERA from 2022, https://www.hera.hr/hr/docs/HERA_izvjesce_2021.pdf (25.04.2023.)

As for the rise in energy prices in Croatia in general, as well as in the rest of Europe and the world, prices rose significantly, which affected all households in a country. Almost half of the gas consumed in Croatia is used by households, 46.3%, while the annual electricity consumption is 18.5 TWh. The price of gas in the European Union is around 120 euros per MWh, and in Croatia it is 2.8 times less (Croatian Government, 2022.), but this does not diminish the fact that energy prices are a long-standing problem for Croatian citizens. The current situation is such that the Government of the Republic of Croatia, with its package of measures to mitigate the rise in energy prices, has reduced the problem for citizens in the short term. However, many have problems with this, as shown by the data from the analysis of the State Bureau of Statistics (15.7% of them who have problems with paying utility bills). Energy prices in Croatia have recently increased by 16% and include electricity, gas, and other fuels as well as water.

2.3 Poor energy efficiency of the home

Speaking about the energy renovation in Croatia, 65% of the residential space consists of family houses. Older houses have almost no thermal insulation and consume around 70% of energy, and good energy efficiency measures can significantly reduce such consumption. In

terms of energy efficiency, Croatia is a little better in its measures. In 2022, a public call for co-financing for the energy renovation of family houses damaged in the earthquake was published, the deadline for applications was until the end of the year, and co-financing of up to 80% of the provided funds is expected. A year earlier, in 2021, over 8,000 requests were received on the same call, and more than 16,000 energy efficiency measures and the use of renewable energy sources were requested (The Environmental Protection and Energy Efficiency Fund, 2022.). The intention is to launch such a Public Call for the year 2023 as well, with which the renovation of around 10,000 family houses and around 300 multi-apartment buildings foreseen. Also, something that represents an additional shift, the renovation of around a thousand additional houses is foreseen with the specific goal of combating energy poverty. Despite this, there are many energy-inefficient houses, that is, housing units, especially in smaller towns and less developed areas and areas where most of the elderly population lives. In most cases, the problem is, apart from low income, poor information of citizens and less interest from the local government.

3 Measures to suppress energy poverty in the Republic of Croatia

Measures to combat energy poverty in Croatia are most often divided into social policy measures and energy policy measures. In addition, the Government of the Republic of Croatia adopted the Guidelines for Energy Savings in the Republic of Croatia, which emphasize measures that can be implemented immediately and are intended to encourage communication about possible energy savings. They refer to measures that can be taken by citizens, public bodies, entrepreneurs, and energy entities. These are mostly short-term measures in the form of advice for saving energy in possible crisis situations.

3.1 Social policy measures

Social policy measures that support vulnerable households also include guaranteed minimum compensation, housing cost reimbursement, and firewood cost reimbursement. However, social policy initiatives primarily address vulnerable energy buyers. In essence, these are all forms of direct financial help, for which there is a legal foundation provided by the Social Welfare Act. This aid can be rendered on a monthly, seasonal, or one-time basis. The co-financing of electricity prices, which, as of March 2023, will be subject to modifications to the Regulation on the monthly amount of compensation for vulnerable energy buyers, amounts to a maximum of EUR 70 and EUR 26.54 each month throughout the year (Regulation on the monthly amount of compensation for vulnerable energy buyer, the method of participation in the payment of energy user costs and the conduct of the Croatian Social Labour Institute, NN 31/2023). This compensation is intended for vulnerable energy purchasers. Benefits such as the guaranteed minimum compensation may be available to an endangered energy buyer.

The guaranteed minimum benefit represents a certain monthly amount that tries to meet the basic needs of households that do not have enough funds. The poorest citizens of Croatia have the right to it, and the competent Center for Social Welfare issues a Decision on the right to it. The conditions are determined based on the income of the applicant and all household members, as well as on the property owned by the applicant and household members. The amount of the minimum compensation is determined according to the prescribed percentage of the base, and the base today is 132.72 euros and is determined once a year. For a single person, basis is 100%, while for a household, it is the sum of the share of each member of the household. Beneficiaries of the guaranteed minimum compensation are also entitled to compensation for housing costs related to communal fees, rent, heating costs, water, and costs incurred as a result of works that increase the energy efficiency of the building or house. The fee is paid from the budget of the local self-

government unit and amounts to at least 30% of the recognized guaranteed minimum fee. Due to the new energy crisis, which is still ongoing, the Government of the Republic of Croatia adopted the so-called The fourth package of measures to reduce prices, which tries to solve the problems of citizens caused by the sudden increase in energy prices. This resulted in a series of mostly short-term measures and supports for households and entrepreneurs. Thus, for example, for pensioners with a pension of up to 610 euros, support for one-time benefits was introduced, and the additional contribution for health insurance was abolished. For vulnerable buyers of energy products, the compensation for energy costs was increased from EUR 66 to EUR 70, the scope of the guaranteed minimum compensation was increased, and the compensation for the costs of purchasing firewood was extended for all households. There are also many other supports from the social policy domain for vulnerable customers, the unemployed, recipients of child benefits, students, and people with disabilities.

3.2 Energy policy measures

Energy efficiency initiatives and specific regulatory actions, like switching energy suppliers or outlawing network disconnections, are the two primary categories of energy policy measures. In order to combat energy poverty, energy efficiency measures should be prioritized because they increase the comfort of dwellings while consuming less energy, both of which have several good impacts. These actions save money, provide energy security, and eventually improve health. The Republic of Croatia's National Energy Efficiency Action Plan for the years 2022-2024 lists the following as energy-saving initiatives (Ministry of Economy and Sustainable Development, 2022):

- horizontal measurements,
- measures in certain sectors of final (immediate) consumption,
- measures in the energy conversion, transmission, and distribution sectors,
- measures to enable and develop responses to demand.

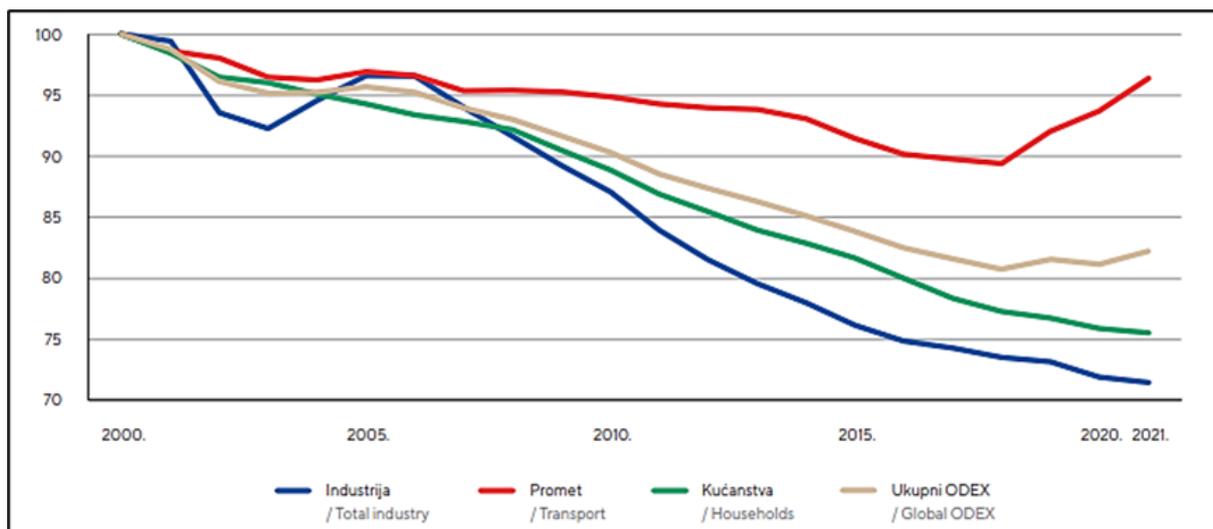
The most significant horizontal measure is certainly the system of energy efficiency obligations, which has been implemented in Croatia since 2019. According to the Croatian Ministry of Economy and Sustainable Development (from the National action plan for energy efficiency of the Republic of Croatia for the period from 2022 to 2024.) the measure is not aimed at any of the sectors of direct energy consumption, but parties can achieve savings bonds in any sector of direct consumption. This measure has precisely defined goals in terms of annual and cumulative savings to be achieved, which are calculated in the Integrated National Energy and Climate Plan. In addition to the energy efficiency obligation system, these measures also include other measures. One of them is the measure of informing and training energy buyers, which represents the legal obligation of the supplier to provide the buyer with informative invoices at least once a year, which also includes information on energy efficiency. Energy efficiency measures are key to solving this problem and must be complementary to social security policies. Measures in the final consumption sector include measures for buildings, measures for the public sector, measures for the transport sector and the industrial sector.

The measures for building construction are significant because they relate to multi-apartment buildings and family houses and make up over 90% of the total funds in Croatia. For this reason, they are also considered crucial for the achievement of national energy efficiency goals. Also, these measures envisage activities aimed at citizens who are at risk of energy poverty. The goal of the programs for energy renovation of multi-apartment buildings and energy renovation of family houses is to encourage the renovation of residential units. The building energy renovation program is carried out in two parts: the renovation of buildings not damaged in the earthquake and the renovation of buildings

damaged in the earthquake. Both parts imply that savings in energy for heating are achieved on an annual level of at least 50% compared to the state of the building before the renovation. One of the more important measures for this topic, which belongs to this group, is the Energy Poverty Suppression Program, which includes the use of renewable energy sources in residential buildings in subsidized areas and areas of special state care for the period 2021-2025. Its goal is to renovate a set of buildings managed by the Central State Office for Renovation and Housing, and 100% financing of the renovation is possible.

On the other hand, the family house reconstruction program is carried out in three parts: reconstruction of buildings not damaged in the earthquake, reconstruction of buildings damaged in the earthquake, and a program for citizens at risk of poverty. As with the Multi-apartment Building Renovation Program, for all three parts, it is assumed that savings in the required heating energy of 50% will be achieved compared to the previous situation. For buildings damaged in the earthquake, the co-financing rate is 80% regardless of the category of renovation, for buildings not damaged in the earthquake, the co-financing rate is 40% for individual measures, 60% for integral energy renovation, and 80% for comprehensive and in-depth renovation. While for the third category, those at risk of energy poverty, the co-financing rate is 100%. Energy renovations of buildings and family houses include thermal insulation, roof repairs (insulation of pitched roofs, reconstruction of flat roofs, and repair and replacement of the roof structure), replacement of coverings, replacement of windows with new PVC windows, and structural repair of the building.

Figure 1. Energy efficiency improvement index ODEX, 2000. - 2021.



Source: EIHP - Energija u RH 2021. https://eihp.hr/wp-content/uploads/2023/01/Energija%20u%20HR%202021_WEB_LR.pdf (02.04.2023.)

Figure 1 illustrates how energy efficiency has improved and how, between 2020 and 2021, the improvement index for Croatia's whole economy decreased by about 20%. The sectors that contribute most to this are the home and industrial sectors, while the transportation sector is still growing significantly. This demonstrates that the preceding National Action Plan's actions were regrettably not fully implemented. The findings also demonstrate that not all objectives were met, and it was noted that a shortage of funding contributed to the issue of non-continuity in the measures' implementation.

CONCLUSION

Since energy poverty is a complicated issue, it requires careful consideration. Although there is a global understanding of what the term specifically refers to, no national definition has yet been established. That fact already tells us enough about its complexity. The creation of such a definition of energy poverty would facilitate the comprehension of the issue at the national level, which would eventually foster collaboration amongst the several sectors engaged in its eradication. Setting up the appropriate framework that will be used is crucial to being able to approach the problem's solution effectively. As a first step, it is crucial to implement energy efficiency measures so that it can begin to be suppressed more seriously.

In Croatia, there is a defined vulnerable buyer of energy products, so on that basis, certain measures are implemented in the form of financial benefits, but the energy efficiency system for households is not sufficiently developed. For this reason, it is important to analyze the practices of other European Union countries and see how they could be implemented in Croatia as well. The fight against energy poverty in all forms is necessary to protect the most vulnerable citizens, however, also because the energy market is often unstable and subject to change, which additionally burdens citizens and the economy. In Croatia, energy poverty is still a term related to poverty in general and the social welfare system. However, this is not the case, and a more concrete definition should be addressed first, which should be based on a combination of economic, energy, and social criteria. Such development of the definition would help to improve the coordination and cooperation of the mentioned sectors. It would be easier to establish a system of measurement and monitoring that needs to be carried out to adopt adequate measures. Additionally, better information among the public should lead to increased local cooperation between various interest groups and sectors. Subsequently, co-financing schemes for energy efficiency must be improved, with an emphasis on more energy-efficient home equipment. Financial assistance for investments in solar panels, heating systems, hot water heaters, and similar items would also fall under this category. The previously noted lack of cooperation between interest groups and the local government is evident when examining the study of this activity as a whole, from the law to the measures that are put into action, but there is also a lack of political will. This is most evident in the fact that most of the regulations were adopted to bring the legislation into line with the regulations and requirements of the European Union and not because of a general reflection on the problem.

In conclusion, it can be claimed that Croatia has lately acknowledged the existence of the issue of energy poverty and the significance of finding a solution. However, sufficient, and ongoing research that would present a clearer picture and real insight into the situation, which would ultimately result in better measures and policies, is not being carried out. Croatia is ranked second in Europe by Eurostat and remains at danger of poverty by as high as 20.9%, according to data from the National Bureau of Statistics. It demonstrates the need for increased local involvement in data collecting and analysis. Since social policy plays a major role in addressing energy poverty in Croatia, a mechanism for solving this problem should be considered, which, in addition to social, is also based on energy and economic criteria. A good system of combating energy poverty with the encouragement of renewable energy sources and investments on its own production of all types of energy would very likely make Croatia less energy poor.

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