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Review Article

INSTITUTIONAL FRAMEWORK FOR THE TRANSITION TO RENEWABLE ENERGY SOURCES FOR HOUSEHOLD CONSUMPTION: A CASE STUDY OF THE CITY OF BIJELJINA

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Abstract: *One of the most important concepts in the social sciences in recent decades is the global risk society, proposed by German sociologist Ulrich Beck. He observed that uncertainty and risk-taking have become dominant characteristics of modern societies. In addition to natural or external risks, human-made or manufactured risks are also key features of the global risk society. Global warming and environmental pollution are among the most significant threats in this context. While global warming varies in its regional, national, and local consequences, it remains a global process requiring a global institutional response. Such a response is understandably difficult to achieve in today's deeply divided world. However, environmental pollution, especially air pollution, has consequences that are far more immediate and dangerous for human settlements. Addressing these risks is much easier at the local level. For example, the City of Bijeljina (Republic of Srpska, Bosnia and Herzegovina) is often among the most air-polluted settlements in the region, especially in winter, mainly due to pollution from household energy consumption. Transitioning from fossil fuels (primarily coal) and inefficient use of firewood in individual household stoves would significantly reduce air pollution. The aim of this paper is to analyze the relevant regulatory framework for the transition towards more efficient and sustainable use of renewable energy sources in the household sector in the City of Bijeljina. A favorable institutional framework, combined with appropriate incentives for households in Bijeljina, would lead to greater use of renewable energy sources and, consequently, significantly lower levels of air pollution.*

Key words*: household energy consumption, transition to renewable energy sources, institutional framework, Bijeljina*

JEL classification*: Q42, Q48, R58*

1. INTRODUCTION

Differentiating between natural or external risks and human-made or manufactured risks, German sociologist Ulrich Beck (Beck, 2009) identified them as one of the main features of the global risk society. Global warming and environmental pollution are among the most severe issues in this regard, as never before has a problem affected every person on the planet, and never before has the window of opportunity to act been so short (Alexander, Thompson, Desfor Edles, and Capous-Desyllas, 2018).

Environmental pollution represents an existential threat to human health and jeopardizes the sustainability of modern societies, with immediate and severe consequences for human health. "In 2019, pollution was responsible for approximately 9 million premature deaths. Air pollution (both household and ambient air pollution) remains responsible for the greatest number of deaths, causing 6.7 million deaths in 2019. Water pollution was responsible for 1.4 million premature deaths. Lead was responsible for 900,000 premature deaths. Toxic occupational hazards, excluding workplace fatalities due to safety hazards, were responsible for 870,000 deaths" (Fuller, Landrigan, Balakrishnan et al. 2022).

Manufactured risks have emerged mainly due to human economic activity, especially over the past two centuries. Anthony Giddens' structuration theory (Giddens, 1984) states that individuals and groups actively shape and change social structure through their daily actions. Over time, these actions develop into institutional arrangements that regulate human behavior at various levels (global, national, regional and local). These institutional arrangements will be analyzed according to the neoinstitutional analytical framework (North, 2003), which differentiates between formal and informal institutional aspects of social organization.

Institutional regulatory mechanisms affect human behavior related to environmental protection and pollution in different ways. Nation-states remain the key institutional actors through various legal documents, including constitutions, laws, and strategies. Additionally, most relevant data have been collected at national levels. For example, one country from Southeast Europe, Serbia, is among the ten countries with the highest number of premature deaths due to pollution, with 175 deaths per 100,000 people in 2017 (Fuller, Sandilya and Hanrahan, 2019). It is the only European country among the top ten on this list.

Serbia also ranks first among the countries of the WHO European Region. It is followed by Georgia (140 deaths per 100,000 inhabitants), Bulgaria (137), Ukraine (128), Bosnia and Herzegovina (125), Armenia (117), Croatia (108), Romania (106), and both Belarus and Hungary (105 each) (Fuller et al., 2019).

Nevertheless, environmental pollution (especially air pollution) patterns vary significantly at regional and local levels, requiring adequate and appropriate institutional responses. This leads to the main goal of the paper: analysis of the institutional framework for the transition towards more efficient and sustainable use of renewable energy sources in the household sector in the City of Bijeljina (located in the northeastern part of the Republic of Srpska, Bosnia and Herzegovina).

Research on air quality in Bijeljina has shown a marked increase in the most harmful air pollutants during the heating season (October to April), clearly indicating the significant impact of the types of fuels used for heating (Arsenović, Đurić, Đurić and Senić, 2016). It refers to both heating plants and individual heating systems that use lower-quality coal (Radović, Ilić, Popović, Vuković and Smiljanić, 2022), as well as the inefficient use of firewood in individual stoves, which contributes to significant emissions of particulate matter (PM10 and PM2.5) (Todorović, 2022).

Our focus will be on energy transition in households, especially on transition in heating in individual household systems, which is a generally under-investigated topic, especially in Bijeljina. Heating plants are subject to formal regulation, and it is reasonable to believe that these regulations are followed in most cases. In contrast, the household sector, in terms of heating, has almost no control mechanisms, making it even more relevant for the purpose of our paper.

2. INSTITUTIONS AND ENERGY TRANSITION

The energy transition is a key part of the broader green transition process. These efforts are among the most significant recent attempts to develop effective global institutional responses to global warming and environmental pollution. The 2015 United Nations Climate Change Conference in Paris is a prominent example of a global agreement, although its effects have been modest so far.

However, regional initiatives appear more promising, such as the European Green Deal, which aims to make Europe the first climate-neutral continent. Climate change and environmental degradation are existential threats to Europe and the world. To address these challenges, the European Green Deal was established to transform the EU into a modern, resource-efficient, and competitive economy that ensures:

- Zero net greenhouse gas emissions by 2050.
- Economic growth decoupled from resource consumption.
- No person or place left behind (The European Commission, 2023).

The European Commission has adopted a series of proposals to shape the EU's climate, energy, transport, and tax policies to reduce net greenhouse

gas emissions by at least 55% by 2030 compared to 1990 levels (The European Commission, 2023). For the financial background supporting the implementation of the European Green Deal, the initial plan was to use one third of the €1.8 trillion investment from the NextGenerationEU recovery plan and the EU's seven-year budget. This was followed by additional EU legislative provisions to achieve climate targets, particularly by promoting energy efficiency and renewable energy, as set out in the 'Fit for 55' package.

The 'Fit for 55' package proposed by the European Commission in July 2021 is a set of interlinked proposals aimed at achieving the EU's 2030 climate target as part of the European Green Deal (The European Council, 2023). The package strengthens eight existing pieces of legislation and introduces five new initiatives covering a range of policy areas and economic sectors: climate, energy and fuels, transport, buildings, land use and forestry. These measures are necessary steps for a fundamental transformation of the energy system with a profound impact on European economies, societies, territories and people's lives in general.

This policy framework requires institutional arrangements that ensure the participation of all relevant stakeholders at every level. Regional and local levels are particularly important in this respect, given the vast differences in various aspects of socio-economic development, including levels of environmental pollution and its institutional regulation (Hurley, Fernandez, Bisello, Vacas and Fana, 2019).

An important aspect of the energy transition is addressing energy consumption patterns, particularly in the household sector. Due to its complexity and heterogeneity, the household sector is a key issue in energy transition policy. In the European Union, household energy consumption accounts for about 26% of final energy use, with heating representing the dominant share, exceeding 62% of total household energy consumption. Implementing energy efficiency measures can achieve significant energy savings, which, along with reducing and substituting fossil fuel consumption, contribute to a lower impact on climate change and a significant reduction in air pollution (Pavlović, Madžarević, Ivezić, Živković and Mojić, 2024).

The household sector plays a key role in the energy transition process due to its significant potential for improving energy efficiency and reducing negative environmental impact. This sector offers opportunities to decrease energy intensity, limit greenhouse gas emissions, and transition to renewable energy sources (RES), thereby increasing energy independence. Although it is an important part of the transition, households are also among the most complex sectors for planning long-term energy policies. This complexity arises from the diversity of consumer habits, the technical possibilities for renovating the housing stock, and the economic factors that influence decisions about adopting more energy-efficient systems. However, this very diversity provides enormous potential for implementing measures that can lead to significant energy savings and improved energy consumption efficiency. Enhancing energy efficiency in households can be achieved by improving building thermal insulation, replacing outdated heating systems, using modern energy-efficient appliances, and introducing smart energy management systems. These measures not only help reduce overall energy consumption but also improve citizens' quality of life by lowering energy costs and enhancing living conditions. Given the importance of households in total energy consumption, their active role in the energy transition is crucial for achieving long-term sustainable development goals and reducing greenhouse gas emissions (Madžarević, Pavlović, Mojić, Ivezić and Živković, 2025).

The key institutional framework for implementing these measures has been established by the "Clean Energy for All Europeans" legislative package. This package is a comprehensive set of legal documents that define European climate and energy policy after 2020. It includes and connects several issues related to the household sector. Through this package, Member States are required to set ambitious targets for energy efficiency and decarbonization in the construction and renovation of residential buildings, while also implementing measures for households affected by energy poverty. The Energy Performance of Buildings Directive, the Energy Efficiency Directive, the Renewable Energy Directive, the Regulation on the Governance of the Energy Union and Climate Action, and the Regulation establishing a framework for achieving climate neutrality address the main issues related to the energy transition in European Union households (Pavlović et al., 2024).

Nevertheless, nation-states are likely to remain the strongest institutional actors in this regard. Transnational agreements of this kind still need to be implemented by the national and local governments of individual states through legal documents, strategies, and action plans. Another important issue is the extent to which EU candidate countries adopt and implement these documents. For example, as a member of the Energy Community and a candidate for European Union membership, Serbia has committed to

harmonizing its energy policy and legislation and to accepting technical assistance and support for implementing reforms to align its national energy system with European standards. Serbia has significantly improved its legal framework regarding energy consumption and climate change (Pavlović et al., 2024).

Bosnia and Herzegovina applied for EU membership in February 2016 and was granted EU candidate status in December 2022. In March, the European Council decided to open accession negotiations and invited the Commission to prepare the negotiating framework for adoption by the Council once all relevant steps set out in the Commission's recommendation of October 2022 are completed (The EU and Bosnia and Herzegovina, 2025).

Bosnia and Herzegovina is also a member of the Energy Community. The Energy Community is an international organization that brings together the EU and nine neighboring EU candidate or potential candidate countries to create an integrated regional energy market based on a legally binding framework (Energy Community, 2026). Among its activities, the Energy Community is working toward the energy transition in line with the objectives of the European Green Deal. The decarbonization roadmap adopted in 2021 provides a comprehensive list of legislative and policy actions for reaching the 2030 targets. Energy Community Contracting Parties are in the process of adopting and implementing their integrated national energy and climate plans (NECPs) and transposing the Clean Energy for All Europeans Package into their national legislation. The Commission will gradually introduce new EU Green Deal and REPowerEU rules into the Energy Community in the coming years, which Energy Community Contracting Parties will need to align with. The next step, outlined in the decarbonization roadmap, is to make progress on the EU Emissions Trading System (ETS) and carbon pricing (Energy Community, 2026).

Although the green transition and the European Green Deal have faced significant delays in many areas due to recent unfavorable global political and economic conditions, they remain the most comprehensive efforts to address ecological decline. However, the question remains: how can these formal provisions be translated into actions that improve citizens' lives, especially at the regional and local levels? The next part of the paper will present the main features of the institutional framework for the transition to renewable energy sources for household consumption in the City of Bijeljina.

3. INSTITUTIONS AND TRANSITION TO RENEWABLE ENERGY SOURCES FOR HOUSEHOLD CONSUMPTION: A CASE STUDY OF THE CITY OF BIJELJINA

In general, the institutional framework for the everyday life of citizens of the Republic of Srpska and Bosnia and Herzegovina is much more complex than in most other European countries. This also refers to the energy sector, whose structure is complex and whose competencies are divided among the federal state, two entities, and the Brčko District, leading some authors to call it Bosnia and Herzegovina's Energy Paradox (Novikau and Krupalija, 2025). Although formally on the path to European Union membership, Bosnia and Herzegovina and its inhabitants are, in reality, still far from that proclaimed goal. This conclusion is also grounded on the slight but steady decline in citizen support for Bosnia and Herzegovina's entry into the EU. In 2025, support decreased by 3.4% compared to the 2023 research and by 1.3% compared to the 2024 research. In a referendum on Bosnia and Herzegovina's entry into the European Union, 69.9% of citizens would vote in favor, meaning seven out of ten citizens support accession. Support for joining the European Union is 82.9% among respondents in the Federation of Bosnia and Herzegovina, 46.1% in the Republic of Srpska, and 71.3% in the Brčko District (Direkcija za evropske integracije Bosne i Hercegovine, 2025).

These findings provide strong grounds for discussing the formal and informal institutional aspects of societies. Why are institutions so important for political, economic, and social systems? According to North (2003), institutions are the constraints created by humans to shape interactions within a society. They structure incentives in human exchanges related to political, social, or economic processes. Although formal institutions can be radically transformed by political decisions within a relatively short period, they are never completely discontinuous because they are embedded in informal cultural constraints, such as norms and values (North, 2003). These cultural institutions are much less subject to change, and when changes do occur, they take place over a much longer period (Dahrendorf, 1990).

The process of EU accession in many countries, particularly in Serbia and Bosnia and Herzegovina, is a clear example of the discrepancy between formal and informal institutional aspects of social life. Data on environmental pollution in these countries, presented at the beginning of the paper, indicate that energy transition measures would greatly improve the well-being of their citizens. However, a significant portion of citizens in

countries in the region generally lacks trust in the institutional framework and institutions themselves in various aspects. For example, data from the eleventh round of the European Social Survey show a very low degree of institutional trust in Serbia and Croatia (European Social Survey European Research Infrastructure, 2026). Bosnia and Herzegovina did not participate in this study, but another study reported similar results regarding widespread institutional distrust (Efendic and Williams, 2024). This is especially true for institutional measures transferred from different cultural contexts. In such cases, a vast discrepancy can exist between formal institutional frameworks and informal institutional elements, such as norms and values. With that in mind, the next section will analyze the formal and informal institutional factors that may influence changes in household energy consumption patterns in the City of Bijeljina.

3.1. FORMAL INSTITUTIONAL FRAMEWORK AND ENERGY TRANSITION IN HOUSEHOLDS IN BIJELJINA

The formal institutional framework in this context refers to all documents adopted by government and public administration bodies at all levels that are relevant to the subject in question. By signing the Agreement on the establishment of the Energy Community, in accordance with the commitments of the UN Agenda 2030, the Paris Agreement, and the Sofia Declaration, Bosnia and Herzegovina has demonstrated a clear commitment to the sustainable development of its energy sector. Therefore, the guidelines for energy development in Bosnia and Herzegovina should be based on sustainable development policies with three aspects:

- Security of supply.
- Price competitiveness and energy availability.
- Decarbonization policy, that is, the use of clean energy.

The Framework Energy Strategy of Bosnia and Herzegovina until 2035 was adopted in 2018. This strategy provides guidelines for the development of the energy sector, respecting environmental protection criteria, and recommends further alignment with EU directives that promote the establishment of low CO2 emission energy. For Bosnia and Herzegovina, the need for additional reductions in greenhouse gas emissions from coal-fired power plants and a greater share of cleaner energy in the future production system has been particularly emphasized. The strategy also defines the long-term goal for energy in Bosnia and Herzegovina, which is to create a competitive and sustainable energy system within available capacities, resources, and appropriate dynamics. A stable energy system is essential for the stability and operation of other economic sectors, as well as for maintaining the competitiveness of the economy as a whole. Five key priorities and associated focus areas have been defined:

- Efficient resource utilization.
- Secure and affordable energy.
- Efficient energy use.
- Energy transition and responsibility toward the natural environment.
- Development and alignment of the regulatory and institutional framework (Integrirani plan za energiju i klimu Bosne i Hercegovine. Nacrt – Verzija 8.6, 2024).

Accordingly, entity strategies for the development of the energy sector have been developed:

- Framework Energy Strategy of the Federation of Bosnia and Herzegovina until 2035 (draft).
- Energy Development Strategy of the Republic of Srpska up to 2035.

The National Renewable Energy Action Plan of Bosnia and Herzegovina (NREAP) was adopted in 2016, and based on this, the entities adopted their own plans for the use of renewable energy sources:

- Action Plan for the Use of Renewable Energy Sources in the Federation of Bosnia and Herzegovina (APOEF).
- Action Plan of the Republic of Srpska for the Use of Renewable Energy Sources.

However, latest reports on the energy transition in Bosnia and Herzegovina show a significant delay in implementing the most important recommendations given by the Energy Community. The delay is smallest for the cluster of measures regarding the performance of authorities (51% of recommendations have been implemented), followed by improving the environment (31%), decarbonizing the energy sector (27%), markets and integration (26%), and ensuring energy security (with only 9% of recommendations implemented) (Energy Community, 2025).

Regarding 2030 renewable energy targets, overall and sectoral targets have not been established in the relevant laws, and the final NECP has not been adopted. The draft NECP sets a 2030 target of a 43.6% share of renewable energy in gross final energy consumption, aligned with the 2030 target set by the Energy Community. It includes sectoral targets of 70.1% for electricity, 8.4% for transport,

and 60.8% for heating and cooling. While the transport target (7% by 2030) complies with Article 26 of the Renewable Energy Directive (REDII), the heating and cooling target does not meet the requirements under Article 23 (Energy Community, 2025).

The presented formal institutional framework can generally be evaluated as satisfactory, but it lacks a stronger focus on the household sector, which is one of the most vital aspects of the transition to renewable energy sources. This sector currently accounts for about 41% of total final energy consumption in Bosnia and Herzegovina, with 72% used for space heating (Kadrić, Aganovic, Martinović, Delalić and Delalić-Gurda, 2022). In the household heating, a significant share of household systems is based on firewood, which is formally considered a renewable energy source. However, it is used in inefficient individual stoves, creating a misleading perception of sustainability, while in practice it contributes significantly to local air pollution (Pavlović, Ivezić and Živković, 2021).

Institutional regulation of household energy consumption is primarily the responsibility of local authorities. With this in mind, the following section of the paper will analyze the main aspects of the formal institutional framework for the household transition to renewable energy sources in Bijeljina.

Since 2017, the City of Bijeljina has been committed to promoting and localizing Agenda 2030, adopted by the UN General Assembly in 2015. These activities have been conducted through the Section for Local Economic Development and European Integration, with special emphasis on all aspects of sustainable development: economic development, social development, and environmental protection. This independent section of City of Bijeljina's administration is also responsible for "collecting data, preparing registries, plans, and procedures related to energy efficiency, conducting energy inspections, increasing energy efficiency in energy consumption, establishing a system for monitoring energy consumption through a software platform, implementing projects or specific measures to increase energy efficiency in buildings and other infrastructure owned by the City, and promoting energy efficiency and encouraging energy efficiency projects" (Section for Local Economic Development and European Integration of the City of Bijeljina, 2026).

The main directions for the development of the City of Bijeljina have been established in 2024 (Development Strategy of the City of Bijeljina 2024–2030). This strategic document clearly addresses the issue of air pollution in Bijeljina during the winter months, highlighting the need to replace coal as the main energy source with more efficient and sustainable use of renewable energy sources in the district heating plant, residential buildings, and individual households.

The Sustainable Energy and Climate Action Plan (SECAP) was adopted by the Assembly of the City of Bijeljina on 12 October 2020 for the period 2020-2030. Given the major climate and energy challenges faced by the city, the SECAP brings together, for the first time, the areas of climate change mitigation and adaptation and sets a long-term vision for a sustainable future. By 2030, Bijeljina aims to be a community with an integrated approach to the efficient use of natural resources, energy efficiency, and renewable energy sources – a community not threatened by flooding and capable of adapting to other consequences of climate change (The Sustainable Energy and Climate Action Plan of the City of Bijeljina, 2020).

The objectives outlined in the SECAP include reducing CO_2 emissions by at least 40% by 2030 compared to the 2004 baseline inventory, and decreasing material damage and human losses in climate-affected areas of the city by 90% by 2030 compared to 2021 levels. Energy efficiency measures were defined for the following sectors: buildings, transport, public lighting, and water supply, including relevant subsectors, as well as adaptation measures to climate change within the territory of the City of Bijeljina. Implementing these measures is expected to reduce CO_2 emissions in the city by more than 40% compared to 2004. One indicator relevant to achieving the CO_2 reduction targets is coal consumption data for the period 2017-2023.

Several projects have been implemented in that respect, mainly focused on thermal insulation and energy efficiency improvements in public buildings. Also, to help reduce energy consumption for heating, improve indoor comfort, and lower emissions of particulate matter and greenhouse gases, the City of Bijeljina launched public calls in 2023 to co-finance energy-efficiency improvements in the residential sector for both multi-unit buildings and houses. For example, in August 2025, the City of Bijeljina announced the Public Call for co-financing energy-efficiency improvement measures in the residential sector of the City of Bijeljina for individual buildings. The sum of 180,000 BAM has been allocated for co-investment in installing heat pumps in individual houses (Javni poziv za sufinansiranje mjera poboljšanja energetske efikasnosti u stambenom sektoru Grada Bijeljina za individualne objekte, 2025).

Regarding the transition from coal to other energy sources in the District Heating Plant, it is fair to say that it has been rather unsuccessful so far. In fact, this plant has experienced very serious problems in recent years with regular operation, including frequent interruptions in heat energy delivery, making the transition to renewable energy sources even more urgent but less likely to occur in the near future.

In this regard, the well-known fact that the City of Bijeljina has significant geothermal potential has once again attracted public attention and become a focus of interest for city officials. Utilizing deep geothermal waters could offer a long-term solution for citywide district heating. The plan is to research and test geothermal energy sources in existing boreholes in Bijeljina. In the coming period, a feasibility study for district heating using geothermal sources is planned; this study will serve as the basis for a development plan for the city's heating system (Development Strategy of the City of Bijeljina 2024-2030, 2024).

In fact, such studies have been undertaken earlier. From 2012 to 2024, through EU-IPA Cross-border cooperation Serbia/BiH project "Bijeljina and Bogatić – together on the way of energy sustainability through increase of energy efficiency and promotion of renewable energy sources" has resulted (among other) in two feasibility studies. The first one is the Feasibility study for plants for production electricity and thermal energy from biomass for Bijeljina and Bogatić municipalities, while the second one is the Feasibility study of solar energy use within Bijeljina and Bogatić municipalities.

While the Municipality of Bogatić became the first in Serbia to use geothermal energy for heating at least some public institutions, making it a pioneer in this respect (Bogatić najbolji primer kako koristiti geotermalne izvore energije, 2021), the City of Bijeljina did not move beyond feasibility studies.

However, things are changing in March 2026, when the next steps have been taken. Specifically, an agreement on cooperation for a detailed geothermal research project in the center of Bijeljina has been signed between Bijeljina Mayor Ljubiša Petrović and Dejan Milenić, professor at the Faculty of Mining and Geology at the University of Belgrade and president of the Serbian Geothermal Association, as well as with Ana Vranješ, also a professor at the Faculty of Mining and Geology in Belgrade and head of the Center for Renewable Water Energy Resources (Bijeljina in BiH eyes geothermal energy utilization, 2026).

3.2. INFORMAL INSTITUTIONAL FRAMEWORK AND ENERGY TRANSITION IN HOUSEHOLDS IN BIJELJINA

The formal institutional framework provides only a general legal context for the activities of individual and collective social actors in a society, or, as Douglas North puts it, "the rules of the game" (North, 2003). Sociology primarily illuminates the complex interplay between existing structures, including formal authorities and their decisions, and human action, or agency. An important determinant of individual, organizational, and institutional decisions is the informal institutional aspect. The culture of a particular society is one of the key factors in this regard. In its broadest sense, culture refers to the entire way of life of a people or group. More narrowly, culture can be defined as the specific systems of meaning used to interpret and evaluate the social world (Alexander et al., 2018). Value orientations are the most relevant aspects of culture in relation to decision-making and, in general, serve as landmarks for collective and individual actions (Petrović and Radoman, 2019). In general, decision-making involves purposeful behavior in the presence of alternatives (Azdejković, 2020). The choices individual and collective actors make are also largely determined by the socio-economic context in which these choices occur, mainly in relation to scarcity. Scarcity refers to the unequal distribution of economic, cultural, social, and political resources and the decision-maker's position in relation to these resources (Rojek, 2010).

The transition to more efficient and sustainable use of renewable energy sources is a clear example of the impact of informal institutional factors, especially for households. Such decisions by household members are strongly determined by the household's socio-economic position (Śmiech, Karpinska and Bouzarovski, 2025). Regarding cultural influences on the decision to transition to renewable energy sources, future orientation, individualism, attitudes toward environmental protection, and trust as value orientations of key household decision-makers are most important (Mojić, 2024). Since the first three are well known and well documented, a few additional remarks about the concept of trust will be presented. The literature and research distinguish two basic forms of trust: interpersonal trust and institutional trust. "Interpersonal trust refers to the belief that most people can be trusted, while institutional trust refers to confidence in various institutions, such as the government, the justice system, the health system, the education system, and the media" (Jovanović, 2016).

Both forms of trust are very important for the energy transition in households. Opting for more efficient and sustainable use of renewable energy sources by an individual household would have limited success if neighboring households continue to use energy sources that significantly increase air pollution. Additionally, since the transition to renewable energy involves significant subsidies for households and other forms of institutional activity, trust in the relevant institutions, particularly local authorities and public companies, is very important in this context. As already mentioned, both interpersonal and institutional trust levels in countries in the region (including Bosnia and Herzegovina) are very low compared to others, which poses a significant obstacle to households' energy transition.

CONCLUSION

The energy transition is a scientific issue that requires collaboration between different fields – technical sciences on one side and social sciences on the other. This paper focuses on insights from the latter, primarily drawing on the theoretical perspectives of new institutionalism in sociology and economics. The institutional framework for the transition to more efficient and sustainable use of renewable energy in household consumption in the City of Bijeljina has been outlined only in its main features.

Nevertheless, we hope the scientific and practical contribution of this paper lies in highlighting the complex interplay between formal and informal institutional aspects of such a transition. Both aspects, in this context, must be thoroughly examined. While analyses of formal institutional aspects have been conducted, studies of informal institutional factors – particularly socio-economic and cultural – are very challenging to design and implement.

Regarding socio-economic factors, future research should examine differences among settlements and households in terms of economic resources and socio-demographic characteristics. For cultural factors, in addition to relevant values such as future orientation, individualism, and attitudes toward environmental protection, attention should focus on interpersonal and especially institutional trust. Only with reliable and comprehensive data of this kind can key decision-makers formulate an adequate institutional framework and successful policies. The synergy of all these factors can lead to a successful transition that will significantly improve the quality of life for the inhabitants of the City of Bijeljina.

Let us recall the basic premise of Giddens' structuration theory (Giddens, 1984) mentioned at the beginning of the paper: individuals and groups actively shape and change social structure through their daily actions. However, we must also recognize that these social actors have different interests and varying access to scarce economic, cultural, social, and especially political resources. Still, let us be optimistic (hopefully not naïve) and believe that the change analyzed in this paper – the energy transition in the household sector in the City of Bijeljina – will occur in the near future, leading to a significant decrease in air pollution and an improvement in health conditions and overall quality of life for its inhabitants.

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REFERENCES

[1] Alexander, J. C., Thompson, K., Desfor Edles, L. and Capous-Desyllas. M. (2018). *Contemporary Introduction to Sociology: Culture and Society in Transition*. New York and London: Routledge.

[2] Arsenović, B., Đurić, D., Đurić, N. and Senić, M. (2016). Ispitivanje kvaliteta vazduha na području grada Bijeljina. *Zbornik radova Univerziteta Sinergija*, 126-130.

[3] Azdejković, D. (2020). *Teorija odlučivanja*. Beograd: Univerzitet, Ekonomski fakultet.

[4] Beck, U. (2009). *World at Risk*. Cambridge: Polity.

[5] *Bijeljina in BiH Eyes Geothermal Energy Utilization*. (2026). Available at: https://balkangreenenergynews.com/bijeljina-in-bih-eyes-geothermal-energy-utilization/

[6] *Bogatić najbolji primer kako koristiti geotermalne izvore energije*. (2021). Available at: https://energetskiportal.rs/bogatic-najbolji-primer-kako-koristiti-geotermalne-izvore-energije/

[7] Dahrendorf, R. (1990). *Reflections on the Revolution in Europe*. London: Chatto.

[8] *Development Strategy of the City of Bijeljina 2024–2030*. (2024). Available at: https://www.investinbijeljina.org/en/1931.development-strategy-of-the-city-of-bijeljina-2024%E2%80%932030.html

[9] Direkcija za evropske integracije Bosne i Hercegovine. (2025). *Istraživanje javnog mnijenja: Stavovi građana o članstvu u Evropskoj uniji i procesu integracija u EU*. Available at: https://www.dei.gov.ba/uploads/

documents/ istrazivanje-2025-2_1752737431.pdf

[10] Efendic, A. and Williams, C. (2024). Evaluating the Undeclared Economy in Transitional and Post-Conflict Bosnia and Herzegovina. *Southeastern Europe*, 48, 215-241.

[11] Energy Community. (2025). *Bosnia and Herzegovina: Annual Implementation Report*. Available at: https://www.energy-community.org/dam/jcr:72abf29e-594d-432a-a55d-37b9fa6b2a1a/BIH_IR25CP.pdf

[12] Energy Community. (2026). *Energy Community: Working to Extend the EU's Energy Market Rules and Principles to the Balkans, the Black Sea Region and Beyond*. Bruxelles: The Directorate-General for Energy (DG ENER). Available at: https://energy.ec.europa.eu/topics/international-cooperation/international-organisations-and-initiatives/energy-community_en

[13] European Social Survey European Research Infrastructure (ESS ERIC). (2026). *ESS11 – integrated file, edition 4.1 [Data set]*. Sikt – Norwegian Agency for Shared Services in Education and Research.

[14] Fuller, R., Landrigan, P. Balakrishnan, K. et al. (2022). Pollution and Health: A Progress Update. *The Lancet Planetary Health*, 6 (6), e535-e547.

[15] Fuller, R., Sandilya, K. and Hanrahan, D. (2019). *Pollution and Health Metrics: Global, Regional and Country Analysis*. Geneva: Global Alliance on Health and Pollution (GAHP).

[16] Giddens, A. (1984). *The Constitution of Society: Towards a Theory of Structuration*. Cambridge: Polity Press.

[17] Hurley, J., Fernandez, E. M. Bisello, M., Vacas, C. and Fana, M. (2019). *European Jobs Monitor 2019: Shifts in the Employment Structure at Regional Level*. Luxembourg: Publications Office of the European Union.

[18] *Integrirani plan za energiju i klimu Bosne i Hercegovine (Nacrt – Verzija 8.6)*. (2024). Sarajevo: Ministarstvo vanjske trgovine i ekonomskih odnosa Bosne i Hercegovine. Available at: https://kfbih.com/wp-content/uploads/2024/10/NECP-BiH-finalni-nacrt.pdf

[19] *Javni poziv za sufinansiranje mjera poboljšanja energetske efikasnosti u stambenom sektoru Grada Bijeljina za individualne objekte*. (2025). Available at: https://www.gradbijeljina.org/sr/news/obavjestenja/6682.javni-poziv-za-sufinansiranje-mjera-poboljsanja-energetske-efikasnosti-u-stambenom-sektoru-grada-bijeljina-za-individualne-objekte.html

[20] Jovanović, V. (2016). Trust and Subjective Well-being: The Case of Serbia. *Personality and Individual Differences*, 98, 284-288.

[21] Kadrić, Dž., Aganovic, A. Martinović, S. Delalić, N. and Delalić-Gurda, B. (2022). Cost-related analysis of implementing energy-efficient retrofit measures in the residential building sector of a middle-income country – A case study of Bosnia and Herzegovina, *Energy and Buildings*, 257, 111765-111781.

[22] Madžarević, A., Pavlović, B. Mojić, D. Ivezić, D. and Živković, M. (2025). Domaćinstva i energetska tranzicija u Republici Srbiji: pravni okvir i stvarna praksa. *Energija, ekonomija, ekologija*, 27, 2, 1-7.

[23] Mojić, D. (2024). Socio-Economic and Cultural Influences on the Household Transition to Renewable Energy Sources: A Research Design. In: Zlatanović, D. Stevanović, A. (Eds.). *International Scientific Conference EBM – Contemporary Issues in Economics, Business and Management*. Kragujevac: Faculty of Economics, 279-287.

[24] North, D. C. (2003). *Institucije, institucionalna promjena i ekonomska uspješnost*. Zagreb: Masmedia.

[25] Novikau, A. and Krupalija, M. (2025). Green Energy Transition in the Western Balkans: Challenges and Opportunities for Bosnia and Herzegovina. In: E. Berisha et al. (Eds.). *The Palgrave Handbook of Just Green Transitions in the Western Balkans and Beyond*. Cham: Springer Nature Switzerland, 155-165.

[26] Pavlović, B., Ivezić, D. and Živković, M. (2021). State and Perspective of Individual Household Heating in Serbia: A Survey-based Study. *Energy and Buildings*, 247, 111128.

[27] Pavlović, B., Madžarević, A., Ivezić, D., Živković, M. and Mojić, D. (2024). Energetska tranzicija u domaćinstvima: analiza usaglašenosti Srbije sa paketom „Čista energija za sve Evropljane“. *Energija, ekonomija, ekologija*, 26, 1, 51-58.

[28] Petrović, I. and Radoman, M. (2019). Patrijarhalnost, autoritarnost i nacionalizam u Srbiji: promene vrednosnih orijentacija. U: Lazić, M., Cvejić, S. (priredili).

Stratifikacijske promene u periodu konsolidacije kapitalizma u Srbiji. Beograd: Filozofski fakultet, Institut za sociološka istraživanja, 215-246.

[29] *Project Overview. Bijeljina and Bogatić – together on the way of energy sustainability through increase of energy efficiency and promotion of renewable energy sources*. (2014). Available at: https://srb-bih.org/en/sazetak-projekta-16/

[30] Radović, B., Ilić, P. Popović, Z. Vuković, J. and Smiljanić, S. (2022). Air Quality in the Town of Bijeljina – Trends and Levels of So2 and No2 Concentrations. *Quality of Life*, 13(1-2): 46-57.

[31] Rojek, C. (2010). *The Labour of Leisure: The Culture of Free Time*. London: SAGE.

[32] *Section for Local Economic Development and European Integration of the City of Bijeljina*. (2026). Available at: https://www.gradbijeljina.org/en/1844.section-for-local-economic-development-and-european-integration.html

[33] Śmiech, S., Karpinska, L. and Bouzarovski, S. (2025). Impact of Energy Transitions on Energy Poverty in the European Union. *Renewable and Sustainable Energy Reviews*, 211, 115311.

[34] *The EU and Bosnia and Herzegovina*. (2025). Brussels: The European External Action Service (EEAS). Available at: https://www.eeas.europa.eu/sites/default/files/2025/documents/Bosnia%20and%20Herzegovina%20country%20fiche%20FINAL%202025.pdf

[35] The European Commission. (2023). *The European Green Deal: Striving to be the First Climate-Neutral Continent*. Available at: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en

[36] The European Council. (2023). Fit for 55. Available at: https://www.consilium.europa.eu/en/policies/green-deal/fit-for-55-the-eu-plan-for-a-green-transition/

[37] *The Framework Energy Strategy of Bosnia and Herzegovina until 2035.* (2018). Sarajevo: Ministarstvo vanjske trgovine i ekonomskih odnosa Bosne i Hercegovine. Available at: https://www.mvteo.gov.ba/data/Home/Dokumenti/Energetika/19042022_Framework_Energy_Strategy_of_BiH_until_2035_ENG_FINAL.pdf

[38] *The Sustainable Energy and Climate Action Plan (SECAP) of the City of Bijeljina*. (2020). Available at: https://www.gradbijeljina.org/sr/1873.akcioni-plan-odrzivog-upravljanja-energijom-i-prilagodavanja-klimatskim-promjenama-secap.html

[39] Todorović, I. (2022). *HEAL: Biomasa među glavnim izvorima zagađenja vazduha na Zapadnom Balkanu*. Available at: https://balkangreen energynews.com/rs/heal-biomasa-medju-glavnim-izvorima-zagadjenja-vazduha-na-zapadnom-balkanu