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Energy cooperatives and just transition in Southeastern Europe

D. Končalović[1,3], J. Nikolić[1,3], A. Džokić[3], P. Momčilović[2,3] and D. Živković[1,3*]

Abstract

Background The energy markets of Southeastern Europe largely depend on fossil fuels. Energy prices are lower in this region than in the rest of Europe, while the energy transition is relatively delayed. This paper aims at summarizing the obstacles to the civic energy transition in Southeastern Europe and the future prospects for its success.

Results In Southeastern Europe, there are great concerns about the uncertainty of the energy transition process and its outcomes. There is a lot of apprehensions that the transition could drift away from the citizens and end up in the hands of large-scale solar and wind farms entirely. In other words, citizens may be completely excluded from participating in the energy transition. Renewable energy cooperatives can serve as a crucial vehicle for organizing and engaging citizens in the energy transition. They can also be used as a lever of civic influence. This influence is crucial for ensuring a fair transition. The research methodology on cooperative development includes a literature review and a survey conducted with 240 participants. The participants were local government officials, members of NGOs, businesses, scholars, and citizens. The paper summarizes the answers to the questions which the authors considered essential for deepening our understanding of citizens' attitudes on a (just) energy transition. The results show that the public awareness about the energy transition has increased. In addition, participants have demonstrated a willingness to take action, both as individuals and through cooperative efforts. However, they have also shown a great level of mistrust in the government, mainly due to perceived corruption and lack of transparency. Generally speaking, they have doubts that the energy transition can be completed in a fair and timely manner within their national context.

Conclusions This paper provides insight into the current state of affairs and the prospects for the energy transition based on the attitudes of the citizens in Southeastern Europe. The paper argues that energy cooperatives should be employed as a training ground for the citizens, since, through joint actions, their trust in each other can be regained, rehearsed, and restored.

Keywords Just transition, Energy transition, Energy cooperatives, Civic energy

Background

Europe, especially the EU-15, has become a prominent example of citizen participation in the energy transition through the implementation of over 3000 renewable energy cooperatives [1]. The successful shift from fossil fuels to low-carbon technologies requires the establishment of decentralized energy systems but with the active participation of citizens [2]. As the primary stakeholders, citizens can impact social changes and cooperatives can play an essential role in the social aspects of a country [3]. However, despite their growing presence, the number of energy cooperatives is insufficient. They are still niche players, even in regions, where they are most active. For example, Germany has 10,800 municipalities and only 900 documented energy cooperatives [4]. Therefore, even

*Correspondence:
D. Živković
dubravka@uni.kg.ac.rs
[1] Faculty of Engineering, University of Kragujevac, Kragujevac, Serbia
[2] Faculty of Geography, University of Belgrade, Belgrade, Serbia
[3] Energy Cooperative Elektropionir, Belgrade, Serbia

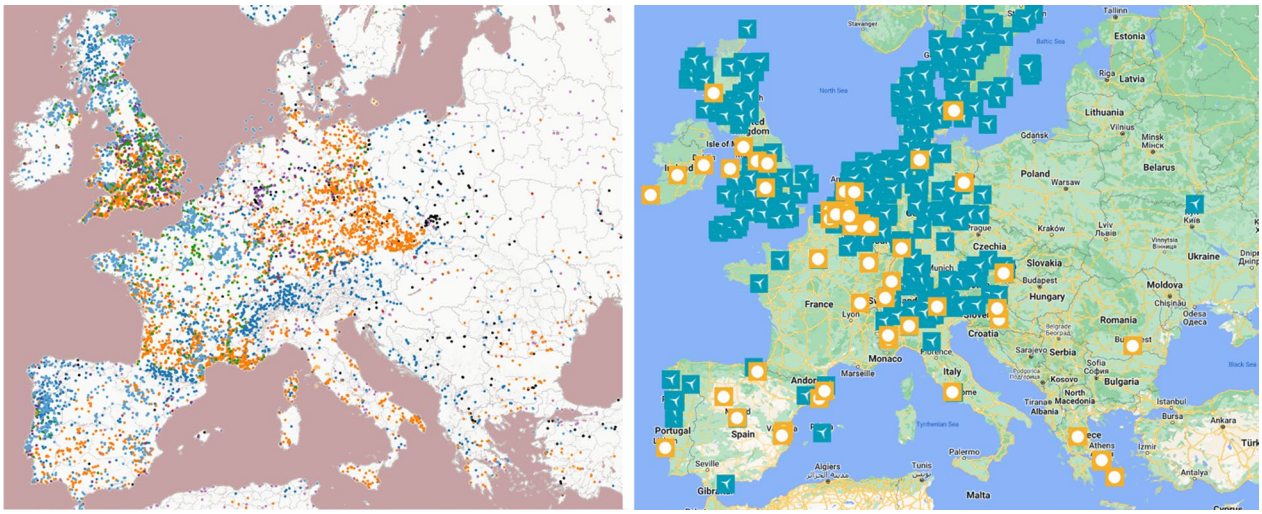

Fig. 1 Distribution of the power plants [6] (left) and the distribution of the members of the RESCOOP cooperatives [7] (right)

if the transition takes place in a citizen-friendly environment, citizens still „feel locked-out of decision-making and locked-in to an energy system that actively limits individual agency and staticises change" [5]. The quoted observation refers to France, Ireland, Italy, and Spain.

The differences in the energy sector of Eastern and Western Europe are visible both in the centralization level of the energy production facilities (Fig. 1, left) and in the citizen participation. The latter is presented here as the number of energy cooperatives in RESCOOP (European Federation of Citizen Energy Cooperatives) members (Fig. 1, right). In Eastern Europe, including post-socialist countries, the establishment of energy cooperatives and the necessary infrastructure is still in its early stages. Currently, the number of cooperatives in these countries is so insufficient that they cannot be even qualified as niche players in the energy market.

The energy sectors of SEE countries (i.e., Albania, Bosnia and Herzegovina, North Macedonia, Montenegro, and Serbia) exhibit several similarities. They mainly rely on centralized energy production [6] which heavily depends on state-owned coal and the plants powered by other fossil fuels [8]. The only exception is Albania, which predominantly relies on hydroelectric energy. The positive aspects of the centralized energy markets are numerous. One of the most relevant benefits is the possibility to keep prices low, so centralized energy production is useful when an energy market is being established, e.g., that benefit was used in South Africa, where the goal was to electrify as many households as possible [9] so the price was formed as a decision rather than a consequence of the realistic market conditions. Furthermore, the centralized wholesale electricity markets have lower transaction costs and higher liquidity than the decentralized markets [10]. In addition, the expected decentralization of the production capacities and the penetration of renewables, especially wind, will result in volatile and less favorable prices of energy [11]. This can affect the population that is already exposed to (energy) poverty.

If the circumstances in the SEE countries are to be compared with the EU countries, the electricity production in SEE can be compared to Poland [12]. Poland is the largest hard coal and second-largest lignite producer in the EU and it generates about 80% of its electricity from coal [13]. Such countries are also highly dependent on the other energy markets for other-than-electricity sources of energy and have not started a true energy transition yet. Moreover, they have only recently started exploring solar and wind energy. The prices of electricity in these countries are among the lowest in Europe, with rates being below 0.1 €/kWh for households.

In addition to the positive aspects of the centralization of the energy sector mentioned above, the negative aspects are now coming to the fore. SEE countries are facing high energy-poverty rates, limited access to clean cooking fuels [14], and a (complete) absence of citizen-produced energy. Other negative aspects include inertia, the unwillingness to include new approaches/concepts (such as prosumers), and the tendency of energy providers to stay in the BAU or monopolistic/privileged position as long as possible. All these factors are known to retard the energy transition.

Regarding socio-economic indicators, the SEE countries rank lower than other European countries in terms of the Corruption Perception Index[1] [15]. Montenegro is the highest ranked SEE country (64th place) and Bosnia and Herzegovina and Albania are the lowest ranked SEE countries (110th place). According to the Democracy Index,[2] all SEE countries are classified as Transitional or Hybrid Regimes,[16]. Furthermore, due to similar levels of economic development, it is expected that these countries will have similar demands for financial support, including the concepts such as subsidy models and various income sources [17].

The energy cooperatives in Eastern and Southeastern Europe are an understudied or under-published topic [18], especially in English. Much of the current literature focuses on the clusters of countries and fails to provide comprehensive, in-depth analyses of individual countries [19, 20]. This highlights the need for further research in this field, so that we could deepen the current knowledge, enable effective comparative analyses, and provide relevant recommendations for policymakers. The scientific community has indicated the necessity to conduct more extensive studies on cooperative development in these regions, so that the existing knowledge gap can be filled with new observations. One such call has been published in [1]: we have to "analyze CE developments in their countries in depth to increase knowledge, and enable fruitful comparative analysis as well as relevant policy recommendations".

This paper provides novel insights into the attitudes of Serbian citizens toward the energy transition. The citizens' perceptions presented here are specific to the Serbian context. However, these observations may be relevant for other SEE countries due to the large-scale similarities between them. However, they should not be automatically applied without the consideration of their specific contexts. It is important to note that the authors are affiliated with the Serbian energy cooperative *Elektropionir* [21], because this paper partly reflects their experiences and efforts to promote civil participation in the energy transition under the existing conditions.

Methods

The first step of this research was an extensive literature review. This step aimed at deepening our understanding of the context in which the cooperatives are currently operating in the SEE countries. We strived to identify the potential roles that cooperatives may play in the energy transition and to determine to what extent they can participate in making the transition just. When relevant, the paper will focus on the current situation in Serbia, since the authors gathered most of their experience through their activities in this country.

The second step was to collect the answers to the questions that the authors considered most essential for understanding the attitudes about the (just) energy transition. Grounded in cooperative values, such as education, training, and information dissemination, the cooperative *Elektropionir* carries out a course called "*Solartehnika narodu*" (*Solartechnique to the People*) biannually. The course has been attended by 240 participants in total. They came from various Serbian cities and different backgrounds, including local government officials, NGOs, businesses, scholars, and citizens. The authors hereby fully acknowledge that the sample of the survey respondents cannot be considered fully representative due to the number of participants and the fact that they are proactive citizens whose level of awareness about energy and environmental issues is significantly higher compared to a prototypical member of the society. However, the sample is indicative and the findings can be employed as a useful guide for designing more representative studies in the future.

During the course, the data were collected on participants' perceptions of the energy transition and its potential, their potential role in this process, joint investments, and the role that a cooperative could take. None of the study participants were members of any energy cooperative. The data were collected via a questionnaire with or without the answers provided. The anonymity was ensured to avoid the reluctance of the participants to provide their authentic and truthful observations and opinions.

The final step was the assessment of the obtained answers. The answers had to be analyzed in detail to make a summary of the most repeated answers. The summary is a useful guide for policy-makers at both regional and national levels, since it indicates the direction in which cooperatives' actions should move toward in the future. Finally, the findings were compared to the data available in the current literature. In other words, we have highlighted the instances of good practice and/

[1] The Corruption Perceptions Index (CPI) is established by Transparency International as a global corruption ranking that measures how corrupt each country's public sector is perceived to be, according to experts and businesspeople. Each country's score is a combination of at least 3 data sources drawn from 13 different corruption surveys and assessments. Data sources are collected by a variety of reputable institutions, including the World Bank and the World Economic Forum.

[2] The Democracy Index is an index compiled by the Economist Intelligence Unit, the research division of the Economist Group, a UK-based private company that publishes the weekly newspaper The Economist. The index is based on 60 indicators grouped into five categories, measuring pluralism, civil liberties, and political culture. In addition to a numeric score and a ranking, the index categorizes each country into one of four regime types: full democracies, flawed democracies, hybrid regimes, and authoritarian regimes.

or the examples of cooperative actions that succeeded to overcome identical or similar unfavorable circumstances and change the discouraging perceptions that the citizens had had.

Current perceptions

It should be highlighted that there should be no illusions about a "perfectly" just transition. As stated in [5], every energy transition has had its winners and its losers, both economically and in terms of social justice and community cohesion. Yet, the exclusion of citizens from the energy transition and the lack of citizens' participation in the energy transition and/or energy cooperatives poses several threats. Despite the availability of technical opportunities for citizens' participation, the European renewable-energy market is already dominated by large companies [22]. Financial constraints are the main obstacle to the activities of energy cooperatives [23]. The current regulatory frameworks and policies often hinder citizen participation in cooperative initiatives. In the EU, unsustainable regulatory frameworks and policies obstruct any increase in the current citizen participation in cooperative initiatives [24, 25]. The initial investment depends greatly on the costs of the technology that has to be installed (i.e., wind or solar) and it has been reported that the willingness of citizens to invest in cooperative projects decreases by 2.2% with each elongation of a return on investment [24]. The ability to negotiate with investors, residents, and local governments when cooperative initiatives (such as cooperative plants on school roofs) are carried out is an aggravating factor [25]. Therefore, there is an increased need for cooperative members to take active participation in this process and to influence decision-makers.

It cannot be expected that all participants in the cooperative will invest the same time and effort. A deficient understanding of the novel principles in the management and control of RES projects can be an obstacle to citizens' involvement [26], even though the problem can be facilitated by engaging external experts or cooperative members with adequate knowledge. A smaller group of people, commonly technically and financially educated, will be most responsible for the formation and maintenance of the cooperative [27]. A particular set of difficulties stems from the fact that the energy transition is becoming increasingly complex; to the extent that professional management is proposed as a necessary prerequisite for the success of cooperatives [28].

The citizen-led renewable energy projects in the SEE countries face various challenges. First, the decision-makers are failing to provide strong initiatives to involve citizens in the energy transition. Effective roadmaps or state strategies are a true rarity, state-produced strategies are either not adjusted to realistic circumstances or not visible enough to the public. Slow bureaucracy and complicated permission procedures [1], administrative barriers, and low energy prices resulting in unfavorable payback periods are also huge obstacles to citizen participation in the energy transition. Furthermore, early adopters of the new concepts or new technologies (e.g., prosumers) in the SEE countries, who are a potential source of enthusiasm when implementing a new approach or technology, too often feel that the legislator has failed them and their interests.

While this confusion exists among citizens, industry and large capital can reach decision-makers and outcompete citizen investments more easily, leading to a potential transfer of electricity-production capacities from state-owned entities to large corporations. Industry and large capital have an initial advantage, as they invest in larger plants with lower prices per installed kilowatt and lower associated costs per kilowatt, which can further dwarf citizens' participation in the energy transition. This disbalance is not specific to SEE countries. Similarly, the paper [29] identified that the energy cooperatives in the Netherlands are facing competitors that are advantageous in terms of governance power, financial resources, and the existing energy infrastructure. The aforementioned factors and other similar circumstances could limit the opportunities for just energy transition, building a fair society, and addressing energy poverty properly. In the end, the legacy of the previous decades, the wars in former Yugoslavia, and the transition to the market economies have discouraged citizens who have been very doubtful about joint actions. Under all these circumstances, the decision-makers, being unable/unwilling to cope with all the challenges, are developing authoritarian tendencies. Ironically enough, those tendencies are now thriving on the wave of citizens' mistrust that resulted from the similar attitudes the decision-makers had just a couple of decades ago. It goes without saying that decision-makers do not have the motivation to restore citizens' trust in one another in such circumstances.

The main role of cooperatives should be to restore citizens' and/or members' trust in each other. As found in [28], community energy initiatives can grow only from strong social cohesion. In other words, to achieve a successful citizen-led energy transition, it is crucial to establish trust, respect, and willingness to take risks among the citizens [4]. One of the biggest challenges in this process is to identify sensitive groups of citizens and engage them, as their active participation is essential for a just energy transition [30]. We should not forget that any left-out member of society can (actively) retard the transition process. Overall, trust is crucial for the success of the energy transition, as it promotes collective

action, facilitates the adoption of new social norms, and enhances citizens' willingness to support government policies aimed at the energy transition.

It is always uncertain whether all goals are achievable, not only in the SEE countries but in each country on the planet, because multiple factors can affect the success of cooperatives: low-risk business model, common idea/vision, a sense of community/togetherness, environmental awareness, credibility, trust, etc. [28]. The trust of citizens in each other and the trust they have in a cooperative are crucial while concurrently, a successful cooperative model could help establish citizens' trust in each other and the cooperative. This vicious circle can be broken through multiple iterations. We must keep in mind that, a trust may, therefore, be functional for the development of community renewable energy and potentially can be enhanced by the adoption of a community approach, this cannot be either assured or assumed under the wide diversity of contexts [31]. Thus, we can hope that, under adequate conditions, multiple iterations will help citizens reach a desired level of social cohesion.

There are numerous inevitable perils which surround the transition process if the foundations, mainly citizens' trust in one another, are not properly established. Strong civic and activistic uphold, especially the anti-nuclear movement, has been and continues to be a major factor in shaping public opinion worldwide [32]. In addition, without this stronghold, one possible course of events is the hasty decision to embrace nuclear energy if the energy transition is delayed and the long-standing issues are neglected. The implementation of nuclear energy can lead to further challenges. The region will keep depending heavily on coal for a decade at least. This would obstruct systematic investments in renewable energy sources. Even if a nuclear power plant is completed and begins generating electricity, the dependence on imported nuclear fuel and the political influence that such dependence carries will remain an unresolved issue. Furthermore, transparency issues arise when dealing with such high-investment, centralized energy sources in the SEE countries. Finally, there is a legitimate concern that such a long-term project would take significantly longer than expected or not ever be fully completed.

Future prospects

Grassroots movements have been gaining momentum in the SEE countries over the past decade, with diverse yet interconnected goals that include numerous topics from advocating for clean air to protecting free-flowing rivers in the Balkans. The principles espoused by energy cooperatives [33], including voluntary and open membership, democratic member control, economic participation through direct ownership, autonomy, and independence, education, training, and sharing of information, cooperation among cooperatives, and concern for the community, are aligned with the grassroots movements' objectives and the opposition to the tendencies toward authoritarianism and Balkanization.

These shared values can create social consensus and tie individuals with local actors [18]. Moreover, cooperatives promote energy democracy through joint decision-making [19], enabling individuals to contribute to the energy transition through the infrastructure they build [34]. The significant advantage of cooperatives is that they can initiate and contribute to various business fields that improve local communities [23], by creating new jobs and supporting social growth [35]. As a result, the RES community projects are expected to play a crucial role in the just energy transition by decentralizing finance, promoting local infrastructure and technologies, increasing energy literacy, and combating energy poverty and inequality [2].

The 2021–2023 global energy crisis, mostly caused by the COVID-19 pandemic and the Russian–Ukrainian conflict, can be seen as a significant opportunity for engaging citizens in the energy transition. The unstable energy market and the uncertainties about supply, combined with the persistent energy and environmental issues, particularly in the SEE countries, are favorable conditions for citizen mobilization. In comparison with the prosumer model, the involvement of citizens through energy cooperatives can now be encouraged more easily thanks to the relatively lower financial threshold. In addition, equality in participation in cooperative activities and decision-making processes is crucial [23]. Hence, the cooperatives could be recognized as a potential training ground for practicing how to develop trust in fellow citizens.

The studies and examples from the northwestern regions of Europe demonstrate that the involvement of citizens as prosumers can empower them and result in more meaningful participation in the energy market. This participation can take various forms, such as the establishment of energy supply companies, the implementation of peer-to-peer market mechanisms, or taking over the segments of distribution networks [34]. In addition, prosumers can contribute to energy storage and, in this way, they can also enable their active role in the energy market.

The specific values nurtured by cooperatives foster a mutually beneficial relationship with their members, leading to increased loyalty and positive promotion of the cooperative through word-of-mouth. This, in turn, can lead to the rapid growth of membership within a short period, due to these favorable conditions [36].

In Europe, there are many examples of clear support for a just transition and citizen participation that legislators provide. In 2000, Denmark implemented a policy that limits wind-turbine ownership to individuals living close to the installation sites. As a result, there has been a marked decrease in corporate ownership of wind farms, with farms, individuals, and energy cooperatives now owning 80% of all wind farms in Denmark [37]. An example from Hungary, the *Vép* wind farm project, involved an investor who transferred 20% of the power-plant ownership to residents, making them co-owners and allowing for the ethical channeling of large investments [1]. This type of practice could be especially beneficial for communities facing energy poverty. Similarly, the cooperative *Ecopower* in northern Belgium has implemented a fair billing structure that is regarded as one of the most equitable in the Flanders region [18].

Any government considering or working with grants or subsidy schemes for low-carbon technologies will further enhance equitable distribution and promote the adoption of low-carbon technologies by providing dedicated financial support from local and national government authorities to energy communities [38]. Therefore, it is important for governments and other relevant stakeholders who initiate and influence the development of energy communities to incorporate the needs and preferences of their citizens in the development of policies on energy cooperatives [39]. The simplification of administrative procedures could provide a significant opportunity to facilitate the involvement of prosumers. For instance, in Portugal, self-consumption PV installations under 30 kWp do not incur any fees, and only installations rated over 100 kW require approval from the grid operator. Similarly, in Latvia, systems below 11.1 kWp do not require any permits. Shortening or limiting the duration of administrative procedures could also be beneficial. For example, Lithuania has proposed that procedures should be completed within 30 days [40].

Regarding financing, research has shown that an increase in profit of 100 EUR can lead to a nearly 3% increase in willingness to invest in projects. Moreover, citizens show a greater willingness to invest in projects that are located in their vicinity, which offers a unique opportunity for local cooperatives [24]. In addition, cooperatives can provide additional benefits [27] to profit-oriented stakeholders, such as suppliers and aggregators, which makes them attractive partners for cooperation. In addition, energy cooperatives and communities have an opportunity to engage citizens in active participation through media promotion [26].

On the other hand, in the SEE countries, there is no legislative framework that supports and strengthens cooperatives. In Serbia, the energy communities have been introduced into the Law as a concept, but their jurisdictions, limitations, and field of possible actions are still undefined. Likewise, no law acknowledges and defines energy cooperatives as such, so their operations are regulated by the general cooperatives law.

In the end, the countries established after the dissolution of Yugoslavia have a rich history of autochthonous cooperatives that were successful in driving rural development. Although their original mission may no longer be relevant, the cooperative spirit that drove their success could be revived for the contemporary energy transition efforts.

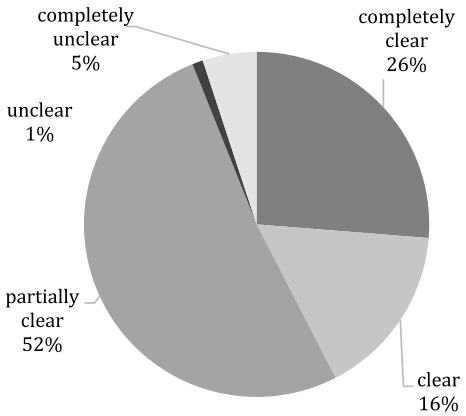

Fig. 2 How clear is the term "energy transition" to you?

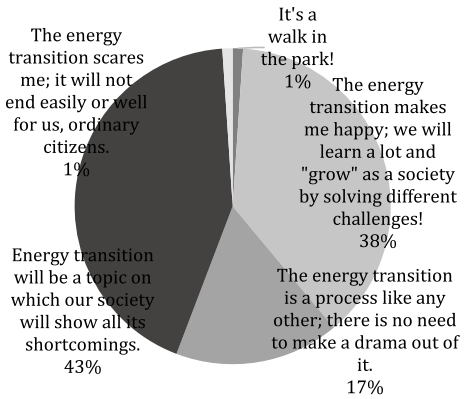

Fig. 3 In your opinion, what is the most accurate statement regarding the energy transition?

Results and discussion

How do citizens understand the energy transition?

The level of comprehension of the energy transition among the citizens varies to a great degree (Figs. 2, 3). This can be contributed to the obvious differences in educational levels, access to information, and personal interest in the topic. There are still many

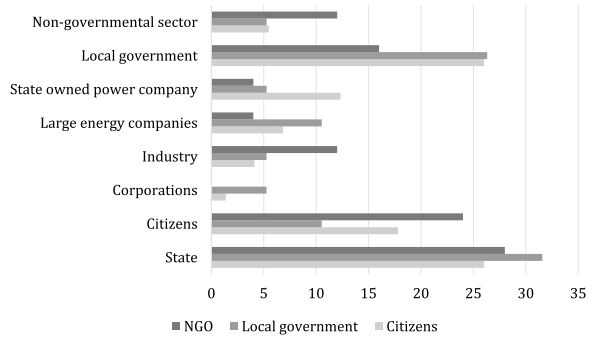

Fig. 4 Who should lead the energy transition in Serbia? [%]

misconceptions and misunderstandings about the energy transition, particularly when it comes to the issues of urgency and scope of climate changes and related issues. On a more down-to-earth level, there are misconceptions about the cost and reliability of renewable energy. Some people may also have concerns about the impact of renewable energy on jobs and local economies and the environment.

In general, there is growing awareness among the general public about the process and the respondents who participated in the survey gave a very balanced view on the issue in question. When asked, What does "energy transition" mean for you?, the participants answered:

1. Decarbonization and decentralization of energy production.
2. Abandonment of fossil fuels, the introduction of renewable, environmentally friendly energy sources.
3. A step toward a better and healthier life.
4. Reduced usage of resources, based on real needs, and switching to renewable resources as much as possible.
5. Awareness that energy is a social asset that belongs to society.

The answers to the question Who should lead the energy transition? vary slightly depending on the background of the respondents (NGOs, local governments, or citizens). Approximately a quarter to a third of respondents, regardless of their background, believe that the state should take the lead. Local administration is the second most trusted group, although this opinion is not shared by those in the non-governmental sector. The citizens are ranked as the third most preferred leaders. This view is not shared by the respondents from the local administration. In general, corporations, industries, state-owned energy companies, and other options are not highly favored by our respondents (Fig. 4).

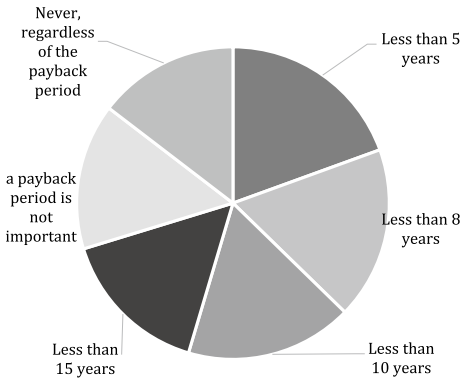

Fig. 5 What are your expectations from the payback period in solar energy?

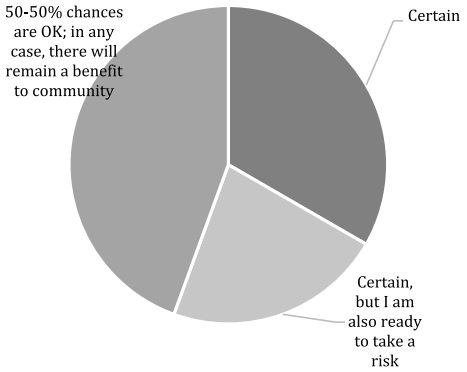

Fig. 6 Profit from an investment in solar energy should be

How do citizens perceive individual, joint, or cooperative investment during the transition?

As highlighted in [1], other-than-profit motives are significant driving factors for individuals interested in engaging in the energy transition. This inclination toward social and environmental values was confirmed when the energy cooperative *Elektropionir* carried out a crowd-funding campaign for the construction of two solar power plants on Stara Planina, a mountain located in southeastern Serbia, in 2022. This was the first completed crowd-funding campaign of this kind in Serbia. It demonstrated successfully that citizens' values can be translated into concrete action.

As can be seen in Figs. 5 and 6, approximately one-third of the participants do not prioritize profit or a payback period. Similarly, roughly two-fifths of the participants do not prioritize profit maximization.

Similar to the previous findings, the results indicate that approximately one-third of the participants are willing to participate in the energy transition through energy cooperatives, while another third is open to consider this type of potential involvement (Fig. 7).

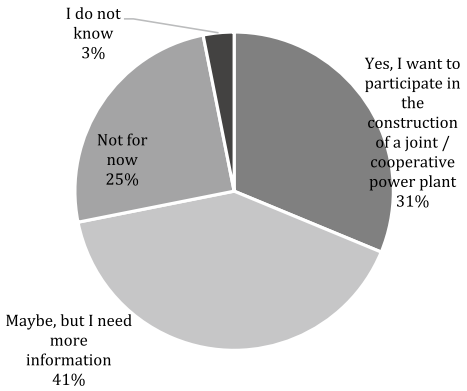

Fig. 7 Are you interested in joint investments in a cooperative power plant?

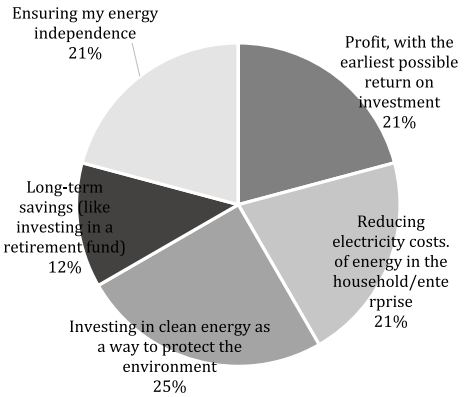

Fig. 9 How do you perceive the investments in your own solar power plant?

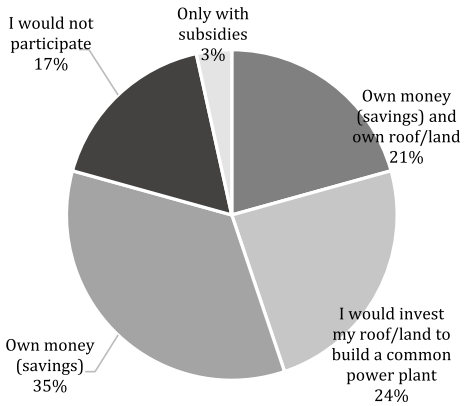

Fig. 8 How/what would you like to invest in a shared power plant?

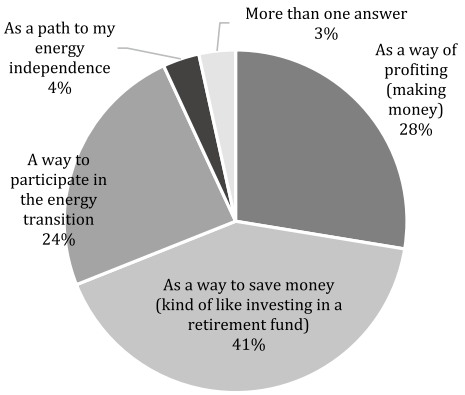

Fig. 10 How do you perceive the investments in the joint power plant?

The manner in which the citizens could participate in energy production varies among the interested citizens, particularly in terms of the source of finance or goods. The majority of the respondents prefer to participate with their savings or a combination of savings and their land. However, the citizens do not express interest in taking on loans (risks) for the sake of participating in the energy transition (as depicted in Fig. 8).

The motives for investing in either individual or cooperative power plants differ, as demonstrated in Figs. 9 and 10. The most common reasons for investing in an individual power plant include environmental protection, cost reduction, and profitability. However, when investing in a cooperative power plant, the primary motive is to save money through a pension fund-like model, followed by profitability and participation in the energy transition.

How do citizens perceive the prospects of the energy transition?

The citizens' perceptions of the socioeconomic forces, mainly corruption, reflect on their predictions about the success of the energy transition. Corruption is perceived as a force that will lead to inefficiencies, mismanagement of resources, and a lack of investment in renewable energy sources, which could retard the transition to cleaner energy. They also question the transparency of the decision-making processes and have serious worries that corruption could lead to a lack of investment in renewable energy projects or a bias toward traditional energy sources. Specifically, when asked What do you see as the biggest obstacle to the successful completion of the energy transition in our country?, participants answered:

1. Huge investments are needed, and we are a poor country steeped in corruption.
2. I believe that the transition will have been completed by 2050; there will be no obstacles: they will shut down the coal power plants, import electricity and that's it.
3. The state of consciousness of the politicians and people in general, combined with poverty.

4. Too many fake experts and corruption.
5. Corruption, for sure.
6. Revenge of bad students.[3]
7. Corruption, people's ignorance, and lack of interest.
8. Cheatings in schools that were not sanctioned when they were supposed to be sanctioned.
9. Corruption and apathy of the majority of the population.

The citizens' fears related to the energy transition stem from a variety of factors, including economic concerns, geopolitical issues, environmental impacts, and societal changes. They are anxious about falling behind other countries in the renewable energy transition, which can have additional economic and geopolitical consequences. Concurrently, they are afraid that hesitance or resistance to take action will potentially lead to external pressure from other countries to take steps that may not suit the nation's current situation or interests.

Other fears are related to interruptions in energy supply or insufficient availability due to high prices, which could impact daily life and economic activity. Increased costs associated with the energy transition, which could lead to someone even "charging the air", are identified as yet another concern.

The furthest-reaching fears are related to global issues, crises, and wars. The consequent redistribution of energy resources is perceived as something that could result in the regression of society, potentially even to the point described as a "stone age." Some of the specific answers to the question When we talk about the future, the energy transition, and energy in general, what are you afraid of? were as follows:

1. That we will be lagging behind the others.
2. From the interruption of energy supply or insufficient availability due to high prices.
3. That someone will start to charge the air.
4. From the global crisis and wars aimed at the redistribution of energy resources.
5. I'm afraid of going back to the stone age.
6. From the ecosystem collapse.
7. From our hesitance, so we may end up being forced by the Western powers to take steps that will not suit our current situation.
8. I am not afraid of the energy transition. I fear that it will happen too slowly.

[3] Adopted sociological term in the SEE countries rooted in the past socio-political situation which stems from the idea that individuals we may have known as students with poor grades and violent tendencies in elementary or high school, have now reached middle age and are seeking revenge against majority.

When comparing the prospects of Serbia with those of other countries, it seems that there is a sense of pessimism and uncertainty surrounding the energy transition in Serbia. The concerns about the country's ability to implement and benefit from the transition in a timely and effective manner are omnipresent.

The answers given below suggest that Serbia may have a difficult and painful experience with the energy transition compared to other countries and that the whole process may take longer than necessary. The success of the energy transition in Serbia is perceived as dependent on the country's willingness and ability to act and the participants even believe that Serbia will probably be one of the last countries to fully complete the transition to clean energy. There are also concerns that Serbia may be more of an observer of the energy transition and that corruption may hinder its progress, despite favorable legislation. When asked How will Serbia go through an energy transition in comparison with other countries?, the participants answered:

1. In a more difficult and painful way.
2. It will last longer than it would be realistically necessary.
3. It depends on us… Probably in some dormant state.
4. Probably as observers.
5. Slowly due to the corruption. There are good laws, but they will not be implemented in practice.
6. We will probably be among the last to cross the finish line when nothing will depend on us anymore.

When asked about the deadline for the energy transition, the participants provided answers which indicate their uncertainty about the time when the energy transition will be completed. Some believe that it could happen earlier than the assumed 2050 deadline. However, others suggest that the transition could take longer and may only be completed if external forces put certain pressure. There is some concern that the transition will have been completed by the deadline, but not with the needed quality or effectiveness. Overall, there is a lack of consensus on when the energy transition will be completed, and it appears that predicted outcomes can vary depending on a variety of factors. The answers to the question If we assume that the deadline for the completion of the energy transition is 2050, when do you think we will complete the energy transition?, some of the answers were:

1. I believe earlier than that.
2. Transition by definition always lasts as time does.
3. Later than that, and only if we are forced.
4. Until 2045.
5. Until 2075.

6. Before the deadline.
7. Maybe we will have finished it by then but to the detriment of the quality.

When asked about the biggest strengths and advantages of the mentality of the Serbian citizens, which could potentially accelerate the transition, the respondents provided responses that suggest a wide range of opposing opinions. Some expressed pessimism, suggesting that there are no advantages. Others expressed optimism or, at least, their attitudes can be seen as optimistic, but only on the surface. Namely, the same qualities that they identify as potential advantages, such as anger and the Serbian *inat* (spite and obstinacy) can prove to be self-destructive and harmful. The only unambiguously optimistic qualities reported in this survey revolve around the perceived skills of improvisation and self-organization. There is also hope that there are a few educated individuals who can lead the transition, although it remains unclear how far such individuals can go without wider support. The answers to the question What do you see as the biggest strength or advantage of our citizens when we talk about the upcoming transition? are best reflected in the following set of the provided answers:

1. I do not see any.
2. A handful of educated people that will go all the way.
3. There are none compared to the others.
4. Anger, and the desire to be better.
5. Serbian inat[4] (spite, obstinacy).
6. The improvisation to which we are inclined as a nation may be an advantage in this case.
7. Old sources of energy are becoming too expensive, and reaching for new solutions, such as solar energy, will be a logical choice.
8. Self-organization.

How do citizens perceive just energy transition?

When asked about the justice and fairness of the energy transition, the respondents indicated that a just energy transition prioritizes accessibility and sustainability, while also taking into consideration the needs of the marginalized and low-income groups. The respondents also emphasized the importance of ensuring that the transition would not be harmful to the environment, that everyone should have the right to access energy, and that the financial burden of the transition would not fall disproportionately on the marginalized groups. Some respondents believe that a just energy transition is the exact opposite of how the current transition is being implemented in Serbia. The responses indicate that a just energy transition is perceived as a necessary and desirable goal that should prioritize the well-being of both people and the planet. Some representative answers to the question What does "just energy transition" mean for you? are:

1. When every person has the right to produce and fulfill their energy needs under the biophysical limits of the planet.
2. The one that is available to all citizens and is as least harmful to the environment as possible.
3. That the price of switching to new sources is not paid by marginalized groups, the poorest, so that they are not left without access to energy supply.
4. One that makes financial sense for everyone, so that those who usually fail do not fail because of this.
5. Energy is our right!
6. It is a transition that is the opposite of the one that our country is implementing now.

The responses to the question Do you expect our energy transition to be fair or just? suggest that there is a general pessimism or sense of skepticism and doubt about the fairness or justice of the energy transition process. Most answers indicate general disbelief that the transition will be fair or just. Some responses are stated with absolute certainty, such as "definitely no" and "not in our lifetime". Such strong statements indicate how strong is the conviction of our respondents that the process of the energy transition will be fair and just. Some of the citizens' answers on whether or not they expect the transition to be fair include:

1. Definitely no.
2. Not really.
3. When pigs fly.
4. Maybe.
5. Not in our lifetime.
6. Probably not.

In general, the perceptions of the just energy transition could be seen as the outcome that is desirable rather than viable.

Conclusion

The paper provides an analysis of the current circumstances and the viable future prospects of the energy transition in SEE countries. The focus is on the potential to enhance citizens' participation through the

[4] The proud and defiant attitude typically conflicts with what would be beneficial for the nation, but paradoxically, it can serve as a unifying force during challenging periods.

cooperative model. The identified threats stem from decades of neglecting the energy sector, the absence of citizens' participation, and the lack of engagement of decision-makers in the energy transition.

The public has been alarmed by the various environmental issues and the grassroots movements have raised the awareness of the citizens during the recent years. This has created opportunities for citizens to become more involved. In addition, some of the better-informed citizens keep insisting on the principles of just transition. Our research demonstrates that there is growing awareness among the public about the energy transition. The respondents who participated in the survey gave a very balanced view of the subject in question. Approximately one-third of the participants do not prioritize profit or a payback period. Furthermore, approximately one-third of the participants are willing to participate in the energy transition through energy cooperatives, while another third is willing to consider this type of involvement. The motives for investing in either individual or cooperative power plants differ. The most common reasons for investing in an individual power plant include environmental protection, cost reduction, and profitability. However, when investing in a cooperative power plant, the primary motive is to save money through a pension fund-like model, followed by profitability and participation in the energy transition as a secondary consideration.

The citizens' perceptions of socioeconomic factors, such as primarily the level of corruption reflect their views about the potential success of the energy transition in Serbia. Corruption is perceived as a force that will lead to inefficiency, the mismanagement of resources, and the lack of investment in renewable energy sources. All of these can slow down the transition to cleaner energy. The furthest-reaching fears expressed in the survey are those about global issues, crises, and wars that affect the current redistribution of energy resources. The energy crisis, triggered by the conflict between Russia and Ukraine in 2022, has put in jeopardy energy security and catalyzed the noticed trends.

When asked about the biggest strengths of their national context, which could potentially accelerate the transition, the responses were diverse. Some express pessimism, suggesting that there are no advantages. Others express optimism or their attitudes can be seen as optimistic, but only at first glance. The same mentality traits reported as advantageous can turn out to be self-destructive and harmful. The only unambiguously optimistic benefits reported by our participants revolve around Serbian skills of improvisation and self-organization. Some participants are hopeful that there is, at least, a handful of educated individuals who can lead the transition. However, it remains unclear how far such individuals can go without wider support. The further education of the citizens and the decentralization and collective ownership that will increase individual accountability and mutual trust will put the importance of the energy sector and its relationship to the broader economy and environment in the spotlight. The authors hereby suggest that citizens can/should understand the crippling consequences of inaction and take a more proactive role in the transition.

In conclusion, the paper highlights the potential for increasing citizen participation in the energy transition through the cooperative model. The responses from the survey indicate that a just energy transition is seen as a necessary and desirable goal that should prioritize the well-being of both people and the planet. While there are still a lot of challenges to be addressed, the recent developments have created opportunities for the citizens to become more involved in the transition and contribute to future developments in promoting and supporting sustainable energy. On the other hand, even if the worst-case scenario occurs and the profit is not made, the benefits for the society, such as practiced trust in fellow citizens or the benefits for the environment, will remain as the ultimate result of this engagement.

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DK designed the work and interpreted the data. JN designed the work and acquired the data. ADž drafted the work and analysed the data. PM drafted the work and analysed the data. DŽ substantively revised the work and interpreted the data. All authors read and approved the final manuscript.

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References

1. Capellán-Pérez I, Johanisova N, Young J, Kunze C (2020) Is community energy really non-existent in post-socialist Europe? Examining recent

trends in 16 countries. Energy Res Soc Sci 61:101348. https://doi.org/10.1016/j.erss.2019.101348
2. Sebi C, Vernay A-L (2020) Community renewable energy in France: the state of development and the way forward. Energy Policy 147:111874. https://doi.org/10.1016/j.enpol.2020.111874
3. Damberg S (2022) Does creating perceived co-operative member value pay off? An empirical study in the German co-operative banking context. J Co-operative Org Manag 10:100170. https://doi.org/10.1016/j.jcom.2022.100170
4. Fischer B, Gutsche G, Wetzel H (2021) Who wants to get involved? Determining citizen willingness to participate in German renewable energy cooperatives. Energy Res Soc Sci 76:102013. https://doi.org/10.1016/j.erss.2021.102013
5. Lennon B, Dunphy NP, Sanvicente E (2019) Community acceptability and the energy transition: a citizens' perspective. Energ Sustain Soc 9:35. https://doi.org/10.1186/s13705-019-0218-z
6. Resource Watch Global Power Plant Database. https://resourcewatch.org/data/explore/Powerwatch
7. RESCOOP REScoop.eu network. https://www.rescoop.eu/network/map/
8. Ciuta I, Gallop P, Pehchevski, D (2022) Comply or close 2022. CEE Bankwatch Network
9. de Groot RAF, van der Veen VG, Sebitosi AB (2013) Comparing solar PV (photovoltaic) with coal-fired electricity production in the centralized network of South Africa. Energy 55:823–837. https://doi.org/10.1016/j.energy.2013.04.001
10. Ahlqvist V, Holmberg P, Tangerås T (2022) A survey comparing centralized and decentralized electricity markets. Energy Strategy Rev 40:100812. https://doi.org/10.1016/j.esr.2022.100812
11. Alshehri K, Bose S, Başar T (2021) Centralized volatility reduction for electricity markets. Int J Electr Power Energy Syst 133:107101. https://doi.org/10.1016/j.ijepes.2021.107101
12. IRENA and the European Commission (2018) Renewable energy prospects for the European Union: Preview for policy makers. International Renewable Energy Agency, United Arab Emirates
13. Brauers H, Oei P-Y (2020) The political economy of coal in Poland: drivers and barriers for a shift away from fossil fuels. Energy Policy 144:111621. https://doi.org/10.1016/j.enpol.2020.111621
14. Roser M Energy poverty and indoor air pollution: a problem as old as humanity that we can end within our lifetime. https://ourworldindata.org/energy-poverty-air-pollution
15. Transparency International Corruption Perceptions Index. https://www.transparency.org/en/cpi/2021
16. Freedom House Countries and Territories. www.freedomhouse.org
17. Williams NJ, Jaramillo P, Taneja J, Ustun TS (2015) Enabling private sector investment in microgrid-based rural electrification in developing countries: A review. Renew Sustain Energy Rev 52:1268–1281. https://doi.org/10.1016/j.rser.2015.07.153
18. Soeiro S, Ferreira Dias M (2020) Energy cooperatives in southern European countries: are they relevant for sustainability targets? Energy Rep 6:448–453. https://doi.org/10.1016/j.egyr.2019.09.006
19. Capellán-Pérez I, Johanisova N, Young J, Kunze C (2020) Is community energy really non-existent in post-socialist Europe? Examining recent trends in 16 countries. Energy Res Soc Sci 61:101348. https://doi.org/10.1016/j.erss.2019.101348
20. Hewitt RJ, Bradley N, Compagnucci AB et al (2019) Social innovation in community energy in Europe: a review of the evidence. Frontiers in Energy Research 7:1–27. https://doi.org/10.3389/fenrg.2019.00031
21. Energy cooperative Elektropionir. https://elektropionir.rs/
22. Schreuer A, Weismeier-Sammer D (2010) Energy cooperatives and local ownership in the field of renewable energy technologies: a literature review. WU Vienna Univ Econ Bus
23. Yildiz Ö (2014) Financing renewable energy infrastructures via financial citizen participation—the case of Germany. Renew Energy 68:677–685. https://doi.org/10.1016/j.renene.2014.02.038
24. Pons-Seres de Brauwer C, Cohen JJ (2020) Analysing the potential of citizen-financed community renewable energy to drive Europe's low-carbon energy transition. Renew Sustain Energy Rev 133:110300. https://doi.org/10.1016/j.rser.2020.110300
25. Tricarico L (2021) Is community earning enough? Reflections on engagement processes and drivers in two Italian energy communities. Energy Res Soc Sci 72:101899. https://doi.org/10.1016/j.erss.2020.101899
26. Piselli C, Fronzetti Colladon A, Segneri L, Pisello AL (2022) Evaluating and improving social awareness of energy communities through semantic network analysis of online news. Renew Sustain Energy Rev 167:112792. https://doi.org/10.1016/j.rser.2022.112792
27. Gjorgievski VZ, Cundeva S, Georghiou GE (2021) Social arrangements, technical designs and impacts of energy communities: a review. Renew Energy 169:1138–1156. https://doi.org/10.1016/j.renene.2021.01.078
28. Ahlemeyer K, Griese K-M, Wawer T, Siebenhüner B (2022) Success factors of citizen energy cooperatives in north western Germany: a conceptual and empirical review. Energ Sustain Soc 12:29. https://doi.org/10.1186/s13705-022-00354-4
29. Hufen JAM, Koppenjan JFM (2015) Local renewable energy cooperatives: revolution in disguise? Energ Sustain Soc 5:18. https://doi.org/10.1186/s13705-015-0046-8
30. Hanke F, Guyet R, Feenstra M (2021) Do renewable energy communities deliver energy justice? Exploring insights from 71 European cases. Energy Res Soc Sci 80:102244. https://doi.org/10.1016/j.erss.2021.102244
31. Walker G, Devine-Wright P, Hunter S et al (2010) Trust and community: exploring the meanings, contexts and dynamics of community renewable energy. Energy Policy 38:2655–2663. https://doi.org/10.1016/j.enpol.2009.05.055
32. Deng L, Mah D, Cheung DM, Lo K (2023) Civic activism and petition politics in energy transitions: discursive tactics, networking, and media mobilization in an anti-nuclear movement in China. Energy Res Soc Sci 95:102889. https://doi.org/10.1016/j.erss.2022.102889
33. RESCOOP The 7 cooperative principles with examples from energy cooperatives. https://www.rescoop.eu/toolbox/the-7-cooperative-principles-with-examples-from-energy-cooperatives
34. Roberts J, Bodman F, Rybski R (2014) Community Power: Model legal frameworks for citizen-owned renewable energy. ClientEarth, London
35. Smith Stirling, International Labour Office. (2014) Promoting cooperatives : an information guide to ILO Recommendation No. 193
36. Vieta M, Lionais D (2015) Editorial: the cooperative advantage for community development. J Entrep Organ Divers 4:1–10. https://doi.org/10.5947/jeod.2015.001
37. Bauwens T, Gotchev B, Holstenkamp L (2016) What drives the development of community energy in Europe? The case of wind power cooperatives. Energy Res Soc Sci 13:136–147. https://doi.org/10.1016/j.erss.2015.12.016
38. Stewart F (2021) All for sun, sun for all: can community energy help to overcome socioeconomic inequalities in low-carbon technology subsidies? Energy Policy 157:112512. https://doi.org/10.1016/j.enpol.2021.112512
39. Heuninckx S, te Boveldt G, Macharis C, Coosemans T (2022) Stakeholder objectives for joining an energy community: flemish case studies. Energy Policy 162:112808. https://doi.org/10.1016/j.enpol.2022.112808
40. Francesc C (2022) Engaging citizens and local communities in the solar revolution: Rooftop Solar PV Country Comparison Report. Climate Action Network Europe, Brussels

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