



Original research article

# Analysing perspectives on capital, mutual, and general interest: A comparative study of energy cooperatives in Belgium and in Italy

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## ABSTRACT

Renewable energy cooperatives (RECs) play a pivotal role in advancing a new energy paradigm that prioritizes equity and inclusivity. However, there is often ambiguity regarding their potential since their core principle of functioning revolves around serving the mutual interests of their members by providing energy services rather than addressing general-interest missions. Moreover, RECs still operate as businesses that are economically viable and appealing, thereby attracting the influence of financial interests. In this context, balancing the tripartite spectrum of interests, namely capital, mutual, and general, can be complex.

To gain a deeper understanding, we conducted a survey among 5402 members of two RECs, namely Ecopower in Belgium and enostra in Italy, complemented by 20 semi-structured interviews. Our findings indicate that members have mixed feelings about assuming general-interest missions, such as fighting against energy poverty, which do not always align with those of their boards. We also note significant differences between the two RECs, which can be attributed to the distinct contexts in which they operate and their varying stages of maturity. We conclude by discussing the importance of scaling up and the need to adopt a more collaborative approach between the public and third sector to address the complexities of social issues.

## 1. Introduction

The recent focus on the ethical, societal, and political dimensions of energy transitions has shone a light on the issue of energy justice [1] in seeking to address and prevent the reinforcement or creation of inequities, which can especially emerge through the adoption of renewable technologies [2,3]. Central to this concern is the threat of a triple injustice, i.e. economic, social, and environmental, with those who contribute less to pollution being the most vulnerable to its associated risks and the least equipped to protect themselves from energy-related challenges [4,5]. This issue is further exemplified in the struggle against energy poverty – a condition that has been recently defined in EU legislation by the recast of Energy Efficiency Directive (EED) [6] and the Energy Performance of Buildings Directive (EPBD) [7] as “households' lack of access to essential energy services, where such services provide basic levels and decent standards of living and health”.

Energy poverty is a stark reality for an alarming number of European citizens but remains a complex and multifaceted phenomenon that is challenging to understand. Several indicators have been developed at both national and local level aimed at capturing specific aspects of it

[8,9]. Recent statistics underscore the fact that energy poverty has been on the rise in the EU since 2022, indicating that, for example, 42 million people are unable to keep their homes adequately warm, while one out of every five EU households experience one form of energy poverty within a period of four years [10,11].

In this context, the role of Renewable Energy Cooperatives (RECs), structured around ethical values, with a bedrock philosophy rooted in fairness and justice, is becoming increasingly important in addressing this issue, actively bolstered by European legislation [12–15]. In particular, RECs are seen as potential actors in their capacity to realign the energy sector with the needs of society, illustrating the potential for an energy model that is both sustainable and socially equitable [16–19]. Described as “honest brokers”, they have the capacity to channel clean energy solutions to those in greatest need, by ensuring that the most economically disadvantaged individuals and communities are not left behind in the transition to sustainable energy [20–22]. Thus, RECs promote access to clean energy, which should become (partially) decommodified from the market mechanism. This approach positions clean energy as a universal right accessible to all, rather than a private commodity available only to those who can afford it [23].

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Paradoxically, despite their strong emphasis and potential, actual initiatives within RECs aimed at addressing broader public goods, such as social disparities in energy access, are surprisingly limited. Hanke et al. (2021) [24] noted that few cooperatives have taken concrete steps towards the goals of general interests. Additionally, the underrepresentation of marginalized groups, especially the poorest and women, in these cooperatives casts doubt on their commitment to addressing the very vulnerable segments most affected by energy poverty, or indeed their ability to do so. Such a disparity brings into question their effectiveness in facilitating an equitable energy transition [25]. It challenges the notion that cooperatives can guarantee fair access to sustainable energy for all societal members – a concept that may be more idealistic than practical, as suggested by Van Veelen (2018) [26].

Given the complexity and the presumed evolving role of energy cooperatives in bringing general benefits to society, there is a pressing need for ongoing dialogue and strategic reflection on the extent to which these entities can effectively contribute to social objectives like tackling energy poverty. In particular, there is a lack of quantitative data for better framing this issue. To address this research gap, we adopted a comparative methodology that involves an in-depth analysis of two distinct RECs based in two different European regions: *Enostra* in Italy and *Ecopower* in Belgium. This examination incorporated perspectives from both the general members and the board level of energy cooperatives, supported by data collected from 5402 members combined with insights from 20 semi-structured interviews. This triangulation contributes significantly to the robustness and reliability of the results by providing multiple lines of evidence.

In this research, we applied the analytical framework developed by Defourny and Nyssens (2017) [27]. This framework is particularly suitable for enhancing our understanding of the potential of RECs to navigate in a complex landscape of market forces and community expectations. It offers a detailed examination of the distinct challenges encountered by these cooperatives, particularly their efforts to reconcile economic sustainability with their social and environmental missions. This delicate equilibrium is fundamental to renewable energy initiatives, as it enables RECs to address pertinent social challenges while accommodating the diverse – and occasionally divergent – interests of their members.

More precisely, we aimed to conduct a comprehensive examination of the views of both members and board executives within these cooperatives regarding the intentions as well as the challenges and potential conflicts arising in balancing capital interest, mutual benefits, and broader societal objectives. Finally, by comparing these two cooperatives, this study aims to shed light on how different institutional settings – particularly those relating to energy poverty – and the varying degrees of maturity within these organizations might influence their members' views of this study. This is particularly interesting in Italy, which remains largely understudied in terms of energy transition despite strong challenges [28].

Thus, we aimed to answer the following two research questions: What are the differences in the commitment of cooperative members in Italy and Belgium to advancing general interests, particularly in addressing energy poverty, in contrast to their emphasis on capital and mutual interests? (RQ1) Do we observe divergences in the willingness to pursue broader societal interests between cooperative members and the cooperative's board, and if so, what factors contribute to these variations in the two cases? (RQ2).

Drawing from these empirical data, the paper is organized as follows. The next section aims to frame different types of interest that can emerge in renewable energy cooperatives. The third section presents the methodology adopted in the study. Section 4 focuses on the results of our study, which are then discussed providing some policy recommendations in Section 5. Finally, in Section 6, we draw conclusions.

## 2. Theoretical framework

Energy cooperatives signify a transformative shift in the traditionally top-down energy market by embracing the principles of energy democracy in which the value created is redistributed via collective and deliberative decision-making processes, emphasizing community engagement and shared benefits [29,30]. As explained by Defourny et al. (2021) [31] (Fig. 1), RECs are primarily framed as mutualistic organizations, predominantly operating within the principle of reciprocity among its members. This means that the members retain the residual control rights over the organization: the *dominant category* comprises the same members as those belonging to the *beneficiary category*, namely those who appropriate the residual profits generated by the organization [32]. Thus, the core mission of RECs is fundamentally to provide access to clean and sustainable energy sources and/or offer the same competitive energy prices to all their members [33]. This mutuality is also anchored in the adoption of management in which cooperatives are based on procedural justice, grounded in the principle of “one person, one vote”, ensuring that each member has a voice and that decisions represent the collective interests of the organization as a whole rather than just those with the most capital [34].

Consequently, if energy cooperatives are to be seen as highly evolved embodiments of energy citizenship [35,36], they must first ensure that the benefits are distributed evenly among their organizations' members and it is not clear whether they should or would focus on the potential benefits they can provide to people outside their organizations.

Moreover, RECs evolve in a market-driven framework where their financial gains stem primarily from the sale of energy. But their market logic is restricted since the distribution of dividends is typically limited and must be reinvested within the cooperatives to prevent personal enrichment [12,37]. Members therefore accept a limited return on equity, recognizing that within this framework, energy is no longer a private commodity but a common asset. This approach underscores the cooperative's steadfast commitment to prioritizing the collective well-being of the organization over individual financial gain, in favour of a more equitable economic paradigm [38–40].

Principles of functioning are quite different in organizations pursuing general-interest objectives since in such set-ups, the controlling group is distinct from the beneficiaries. These entities adhere to a redistribution basis, where members who benefit from the goods and services are not the same as those who manage the organization. Additionally, they are not acting within the market since these organizations often derive their funding from state resources. This model is typical for charities and associations dedicated to public welfare, which focus on serving specific target groups in tackling issues like poverty [38,41–43].

Building upon this differentiation, the observations of Defourny and Nyssens indicate that there is still a possible “upwards” movement within mutual-interest organizations placing a stronger focus on, and evolving towards, general-interest issues. RECs demonstrate a growing dedication to the welfare of the broader community and, at times, specific groups – a key trait inherent to the principles of energy democracy and citizenship. Notably, there has been a recent surge in attention towards issues related to energy poverty, with RECs increasingly channelling resources to mitigate this challenge. They actively contribute to energy justice by allocating a portion of their cooperative resources to combating energy poverty and offering energy management guidance to help vulnerable households optimize their energy usage [44]. This trend is currently witnessing a gradual shift in the institutional trajectories of RECs, particularly at a time when the concept of a fair transition is gaining prominence on political agendas. This evolution underscores the potential for RECs to have a more significant social impact, transcending the traditional cooperative framework centred on mutual interest [38].

For the moment, a gap remains in the literature regarding the integration of general-interest missions with mutual and capital interests in these organizations. This additional complexity, blending social and

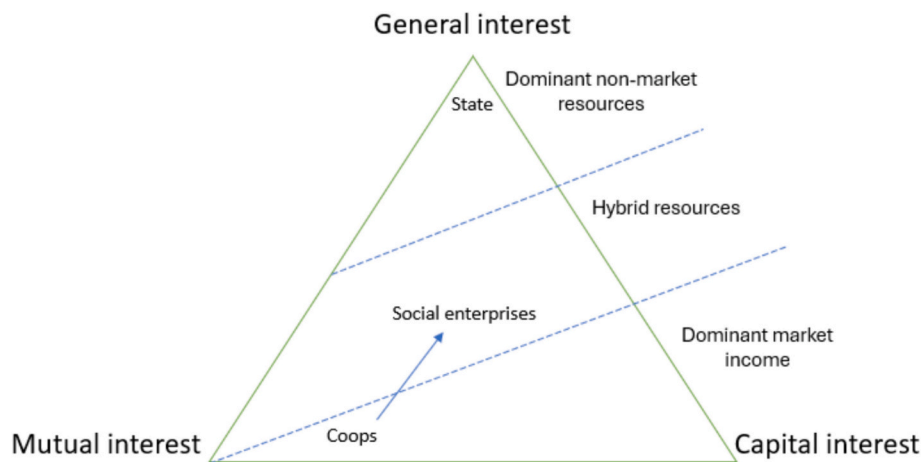


Fig. 1. Defourny and Nyssen's framework, 2017.

environmental goals with economic expectations, raises questions [45]. While cooperative members often demonstrate a willingness to contribute to public benefits, primarily driven by environmental concerns like reducing pollution, the degree to which they are ready to embrace a model that also redistributes economic gains in favour of issues like poverty and more broadly energy justice remains unclear [46–49].

The introduction of the general-interest mission could also be risky, since this multifaceted situation presents a potential conflict, posing a risk of contradictory objectives and agendas among members [50,51], which underscores the urgent need for innovative strategies to effectively organize and harmonize these varied interests.

Here, some factors like the level of business maturity of RECs can play a role, with different perspectives possibly emerging across cohorts but also between members and the board. First, those joining RECs later, when these initiatives are already larger and well established and can ensure significant returns on equity while providing lower energy prices, may be more attracted by market and mutual interests. Conversely, members joining when RECs are younger and smaller, and often less financially rewarding, may find greater motivation in addressing a social or community-oriented perspective rather than economic and financial gains [52]. Secondly, a possible divergence of perspectives in the strategy between members and the executive board could also appear [53–55]. As cooperatives expand, ownership and control by members often give way to a more formalized governance structure. Governance responsibilities tend to be delegated to an elected board, and operational management is increasingly handled by professional managers, marking a shift towards a corporate logic [56,57]. In some instances, this professionalization can lead to a disconnect where the board, being more aware of, and attuned to, specific issues such as poverty, may not fully align with the viewpoints of the general membership.

The literature also suggests that members' prioritization of issues may be influenced by socio-demographic characteristics [58]. For example, studies indicate that women are often perceived as being more sensitive to social concerns [59], likely influenced by societal roles that traditionally assign responsibilities related to care to women [60]. Furthermore, empirical evidence indicates that women, along with younger individuals and those with lower incomes, are disproportionately affected by energy poverty, potentially heightening awareness of this issue among these groups [61]. Additionally, individuals with higher levels of education may be more inclined to uphold ethical energy values [62]. Lastly, it's important to consider the influence of investment levels, as those who have invested more may prioritize financial and economic benefits [63].

### 3. Methodology

Our study explores the three dimensions outlined in the framework of Defourny and Nyssens. Specifically, we examine the orientations of two major European cooperatives towards capital, mutual, and general interests using both quantitative and qualitative methodologies.

#### 3.1. Case studies

We collected data from two energy communities, namely *ènostra* in Italy and *Ecopower* in Belgium. These communities are the largest initiatives in terms of size in their respective countries and represent two of the most prominent initiatives at the European level. *Ecopower* and *ènostra* are both characterized by the same organizational model – they are two cooperatives acting as energy suppliers and based on mutuality principles – and they present similar features with regard to their democratic models and social values. Both of them are members of REScoop.eu, the European Federation of Citizen Energy Cooperatives. Thus, they adopt a democratic organization with an assembly based on the principle of one person, one voice, adhering to a charter of values about inclusivity and a fair redistribution of the outcomes, and trying to empower their members in regard to energy and sustainability. There are no restrictive conditions in either community for potential members wishing to enter, while entrance fees are considered low in both countries [22].

Moreover, traditionally, in terms of their status, both of these cooperatives have been rooted in the principles of mutual benefits, primarily focused on energy services for their members. However, in recent times, they have slightly shifted their approach towards a broader focus on societal interests. One way they have done this is by participating in European projects aimed at addressing poverty-related challenges and integrating a work programme on this issue. This new direction reflects a growing recognition of the need to extend their impact beyond their membership and contribute to the general well-being of the society.

However, beyond their similarities, it's important to note that these initiatives have reached different stages of maturity and have evolved within distinct contexts, providing valuable insights into the diversity and development of energy cooperatives across Europe.

In Italy, the proportion of energy production coming from renewable energy is estimated to be 20.4 %, compared to 13 % for Belgium [64]. Notwithstanding, citizen engagement in the energy transition through energy communities, either in terms of place or interest, in Italy remains underdeveloped and is considered experimental [65,66]. In 2020, Italy had identified only 12 initiatives for energy communities, but that figure has since risen sharply to 207. Meanwhile, Belgium saw an earlier emergence of energy communities, which began peaking in 2017 due to

supportive government policies, with 90 initiatives recorded in 2020, and this has now reached 112 [67,68]. However, when considering the relative scale of energy community initiatives, it is crucial to recognize that Belgium, as well as having a smaller number of initiatives, has a significantly lower population than Italy – making the density of initiatives quite substantial. Belgian energy communities are notably advanced, spearheading over 850 projects involving approximately 163,000 participants, with a total investment of EUR690.3 million. In contrast, Italy has seen 558 projects with the participation of around 79,000 people and a collective investment reaching EUR184.8 million [68]. In Flanders in particular, the legal definition of renewable energy communities is based on the activities they perform and allows for collaboration in the development of energy cooperatives with bigger projects than those led by Ecopower [69].

In this frame, *ènostra* is still at a niche stage while Ecopower in the Belgian market is more mature in terms of the experience and diffusion of collective action initiatives [28,70–73]. Ecopower was founded in 1991, and when we conducted our study in 2020 it had 60,976 members and 46 people working for its administration. In terms of energy production, Ecopower serves 2 % of the Belgian energy market and produces 106 million kWh using solar and wind power, hydroelectricity, and methanation [74]. Ecopower is also able to compete with big actors since for some years it has been the cheapest energy supplier in Belgium. *Ènostra* was created in 2015 and in 2018 it also became an energy supplier, merging with another cooperative organization, namely Retenenergie. In 2020, they had 9806 members and produced 1 million kWh, mainly from photovoltaic plants and, more recently, from one wind power installation. *Ènostra* produces only 14 % of its members' needs and thus depends on market fluctuations [75].

In the realm of national and social frameworks influencing cooperative operations, Italy faces a more pronounced energy poverty challenge than Belgium does [76–78]. Illustratively, when considering an indicator such as the ability to adequately heat homes, data from the National Italian Observatory for Poverty (OIPE) reveal that 8.8 % of Italian households struggle with this necessity. Conversely, Belgium exhibits a lower rate, with only 5.1 % of households encountering similar difficulties [79]. Additionally, the European Energy Poverty Index (EPI), which assesses member states' endeavours in tackling energy poverty, positions Belgium as a frontrunner while labelling Italy as a country falling behind [80]. This discrepancy suggests that Belgium has taken more substantial strides in combating energy poverty and in adopting a more comprehensive energy policy approach than Italy.

### 3.2. Quantitative approach

First, we created a survey and circulated it among the members of the two cooperatives between December 2020 and March 2021. The survey was promoted by both cooperatives through their newsletter with one reminder. We received a total of 5402 responses, with 288 from *ènostra* and 5114 from Ecopower.

First, we looked at the inclination of members to be oriented towards capitalist interest and pure market mechanisms. To do that, we considered the importance given to the return on equity by members, with responses ranging from 1 (not important at all) to 5 (very important) to the following question: (1) “To what extent do you think the prospect of making a profitable investment has played a role in your decision to join the cooperative?” We also explored whether participants viewed energy as a type of good that should be excluded from pure market mechanisms, suggesting a different approach to its management and distribution, with options ranging from 1 (strongly disagree) to 5 (strongly agree) in response to the following statement: (2) “Energy should be managed by citizens as a common good and not as a private issue.”

Second, we looked at the importance for members of their mutual interest in producing and consuming energy. We did that by considering the importance of the main purpose of the organization in gaining

advantages from their participation in terms of their energy bills, with options ranging from 1 (not important at all) to 5 (very important): “Can you tell me how important the economic aspects, saving on energy costs, earning from energy sales, are to you in the cooperative's actions?” In addition, we considered their disagreement with the principle of reciprocity, *one people, one voice*, on which the mutuality is based, with options ranging from 1 (strongly disagree) to 5 (strongly agree) in response to the statement: (4) “The members who have invested the most should have more power than the others.”

Thirdly, we asked them about the general benefits. Here we considered the likelihood of members impacting individuals outside of their cooperatives, essentially assessing situations where the beneficiaries of the cooperative's actions differ from its controlling members. To gauge this, we asked three questions about the importance of addressing environmental and social issues. The responses for the first question ranged on a scale from 1 (not at all) to 5 (to a great extent): (5) “To what extent do you think the prospect of having an environmental impact has played a role in your decision to join the cooperative?” This was followed by two statements, with responses ranging from 1 (strongly disagree) to 5 (strongly agree): (6) “Our cooperative should intervene in the poorest sections of the population to help reduce energy poverty” and (7) “I would like the cooperative to focus on the inclusion of the poorest section of the population to help them to improve their competences in energy management”.

As highlighted in Section 2, we acknowledged that the stage of business maturity of the cooperative influences members' insights and motivations significantly. Those who have been part of the cooperative for longer periods may have perspectives and motivations that differ from those of newer members (i.e. financial attractiveness and size). Based on an extensive review of Ecopower and *ènostra*'s annual reports, we created a categorical variable, seniority, to provide a better picture of the evolution between among [46].

For Ecopower, the first group of members went from the creation of the cooperative in 1991 and included the members joining Ecopower until 2009 (Fig. 2). This choice is justified since, as can be seen in Fig. 2, this period corresponds to a slow period of growth when the cooperative was still at a niche level. Moreover, like Bauwens (2016), we controlled for members joining the cooperative before Ecopower became an energy supplier in 2003. However, we should say that, in this case, the low numbers involved compared to other groups (Table 1 in the Appendices) implied some statistical limitations restricting the reliability of our results, which we take into careful consideration in justifying our choice to consider this group as a whole. The second cohort of members that we consider comprises those joining the cooperative between 2010 and 2015, a time when the cooperative experienced significant development and became increasingly attractive. Many people chose to invest in these models in 2010. In terms of assets, important investments were also implemented during this period. The last period identified spans from 2016 to 2020, when the cooperative stopped its exponential growth and began to reduce its investment. A fundamental issue is also that this time corresponds to a stabilization of the model since the cooperative began to cover its energy needs and become less dependent on the energy market.

For *ènostra*, the members are divided into two groups (Fig. 3): those with less than three years of seniority and those with between three and ten years. In this case, our choice is justified by the fact that the fusion took place in 2018, with *ènostra* starting to become an energy supplier and diffusing its model, seeing a significant increase in its number of members and the development of its own installation.

Coming to the control variables, and to test how the composition of members can impact on the latter's orientations towards the different kinds of interest, we included socio-demographic characteristics of the members coded into categorical variables. Thus, we received demographic data about gender (male/female/other), field and level of study, income (above or below the national median), and age (from 18 to 70 or more, every ten years). We also controlled for the amount of



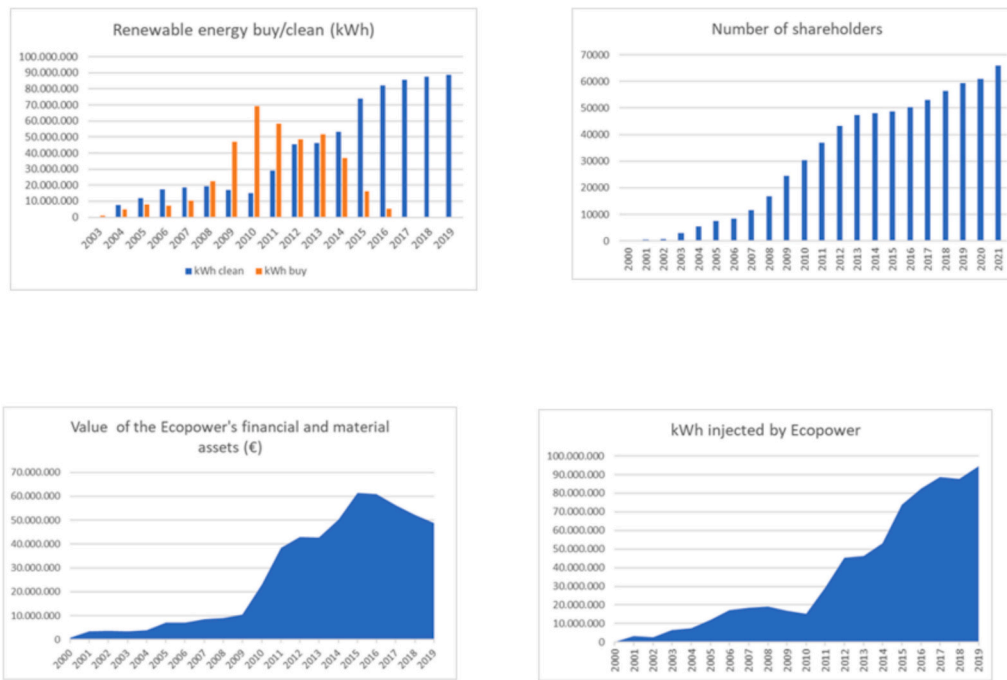


Fig. 2. Descriptive data Ecopower regarding energy provision, financial assets and membership evolution.

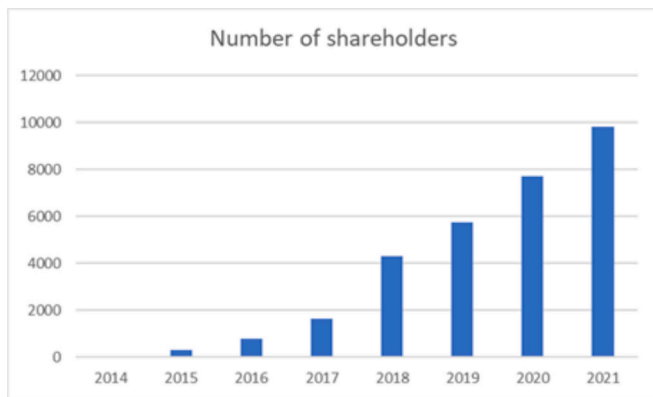


Fig. 3. Evolution of ènostra members.

investment (minimum: €50 for ènostra and €250 for Ecopower, low, high, and very high) (Table 2 in the Appendices).

Our analysis was performed using Stata software (Stata, 2017). For addressing RQ1, given the requirement to compare responses from two cooperatives on a five-point Likert scale, we first give an overview of the median of each variable. We opted for the Mann–Whitney *U* test over traditional parametric tests [81,82]. This decision was guided by several considerations: the Mann–Whitney *U* test retains nearly equivalent statistical power to parametric tests, effectively identifying differences in central tendencies between the two groups, but it does not require the assumption of normal distribution, making it appropriate for Likert scale data, which often do not adhere to normality [83]. Additionally, this test is particularly efficient in cases of unequal sample sizes between groups, as observed in our dataset [84].

Then, given that our dependent variable was formatted as a five-point Likert scale, we implemented an ordered logistic regression model and report the result when strongly significant ( $p < 0.001$ ). To ensure the appropriateness of this model, we first conducted a Brant test to check the parallel lines assumption. In instances where the assumption was violated, we alternatively employed a generalized ordered logit

model (gologit), as suggested by Williamson, to identify eventual incoherencies in the results [85]. We began by examining the specific cooperative membership (Ecopower or ènostra) as the independent variable to provide a general overview of both entities. Based on this, we proceeded with a secondary analysis by incorporating the seniority variable to compare the cohorts of members, adjusting in this case the reference category to discern distinct patterns that we reported when they were significant. In each regression model, we also controlled for socio-demographic variables, i.e. gender, income, level of study, age, and the amount of investment. Finally, we also controlled for interaction effects. We then computed the predictive margins, which was particularly valuable as it allowed researchers to understand the average predicted outcome of a dependent variable across different groups, thereby facilitating a comprehensive understanding of variations within our sample.

### 3.3. Qualitative approach

Given the unequal sample sizes between our two case studies and the self-selection bias inherent in members' responses, our observations predominantly reflect the perspectives of the most engaged members within each cooperative. This discrepancy is particularly notable in the case of ènostra, where the response rate is only half that of Ecopower. Taking these limitations into account, we entered a qualitative phase to delve into a more comprehensive analysis of the insights obtained from 20 in-depth semi-structured interviews with ordinary members, staff, and executive board members lasting between 30 min and two hours in both cooperatives (Tables 3 and 4 in the Appendices) [86].

To facilitate this, we asked a board member from ènostra and a staff member from Ecopower to reach out to their colleagues via email to gauge their willingness to discuss and provide feedback on the findings from our quantitative analysis. At the same time, we asked both cooperatives to invite a diverse range of their members to participate in the interviews, specifically seeking perspectives beyond the typical biased demographic of male engineers, to ensure a broad representation of views. Given the comprehensive nature of the discussions, we observed redundancy in the responses after conducting 20 interviews and chose to conclude the interview process at this point [87,88].

We then conducted a thematic analysis using the software NVivo with a detailed examination of interview transcripts, focusing on the identification of three main categories, namely capital, mutual, and general interests, as stated in the theoretical framework (Section 2). Within the realm of capital interests, we delved into how interviewees perceived market logic, particularly exploring themes related to dividends and capitalist ideologies. For mutual interests, our analysis centred on uncovering the specific advantages offered by the cooperatives to their members, such as preferential energy prices and the organizational structure of cooperative entities. Within the category of general interests, we aimed to capture narratives reflecting a willingness to contribute to broader societal benefits, particularly identifying themes related to interviewees' support for disadvantaged groups through their energy cooperatives and their awareness of social issues.

Additionally, we added a category to examine potential tensions and constraints arising from the intersection of various interests to gauge interviewees' understanding of the complex challenges involved in balancing diverse interests within their cooperatives. We sought insights into the depth of understanding among executive boards regarding these challenges and the strategic directions envisioned for their cooperatives.

This triangulation enables us to provide comprehensive insights for RQ1 while also specifically addressing differences in perspectives between members and their board (RQ2) since quantitatively, the response rate from cooperative boards was insufficient for meaningful analysis compared to that of members.

#### 4. Results

In this section, we will begin by outlining the discrepancies between the two cooperatives regarding the identified interests, i.e. capital, mutual, and general, using our dependent variable based on a five-point Likert scale. Each subsection will provide a comparative analysis of the two organizations, taking into account various factors that may influence these outcomes (RQ1). Additionally, our qualitative data will highlight the impact of different factors on shareholders' perspectives, while underscoring the view of the cooperative board in determining the cooperative's trajectory (RQ2).

As hypothesized, our analysis reveals distinct patterns between the organizations and also within each organization between members and their boards. Additionally, we find that in ènostra the youngest cohorts

of members are more likely to support energy democracy and justice principles. The variables of income, age, and educational attainment were found to significantly influence members' perspectives on the capital, mutual, and general interests in both energy cooperatives. Individuals with higher income levels were generally more inclined to prioritize capital interests, while younger and more highly educated members tended to emphasize mutual and general interests. These socio-demographic factors thus provide insights into the varying motivations and priorities among members of the energy cooperatives.

##### 4.1. Capital interest

With *p*-values of 0.000, the Mann-Whitney statistical tests revealed significant differences across the variables examined for capital interest, leading us to reject the null hypothesis of no distinction when comparing the two organizations (Table 5 in the Appendices).

First, divergent perspectives on the issue of profit became evident, as indicated by the median value of the variable "To what extent do you think the prospect of making a profitable investment has played a role in your decision to join the cooperative?", which was 1 for ènostra and 3 for Ecopower. Delving deeper into the analysis, as can be seen in Fig. 4, the ordered logit model reveals that approximately three-quarters of ènostra members do not prioritize financial profit through their investment as a motivation for joining, while for Ecopower, the predictive margins in this regard are more nuanced since only a third of its members do not do so. Furthermore, the emphasis on profit related to seniority plays a positive role for Ecopower, as it slightly increases the inclination to prioritize profit among the youngest cohort but is only significant between the categories of members with less than five years of seniority and those with over 20 years of seniority. In contrast, for ènostra, new members place less emphasis on this dimension, although the difference is not statistically significantly.

These findings are corroborated by our interviews. In the case of ènostra, the idea of return on equity does not emerge prominently in our conversations with the members, although it is emphasized by the board as a way of attracting new participants. In Ecopower's case, the pattern is more diverse. Some shareholders explicitly emphasized that financial profit is not a key incentive for joining: "If you were to rate your financial motivations for participating in the cooperative, I would say maybe a 3" (interview with Ecopower member). On the other hand, some are

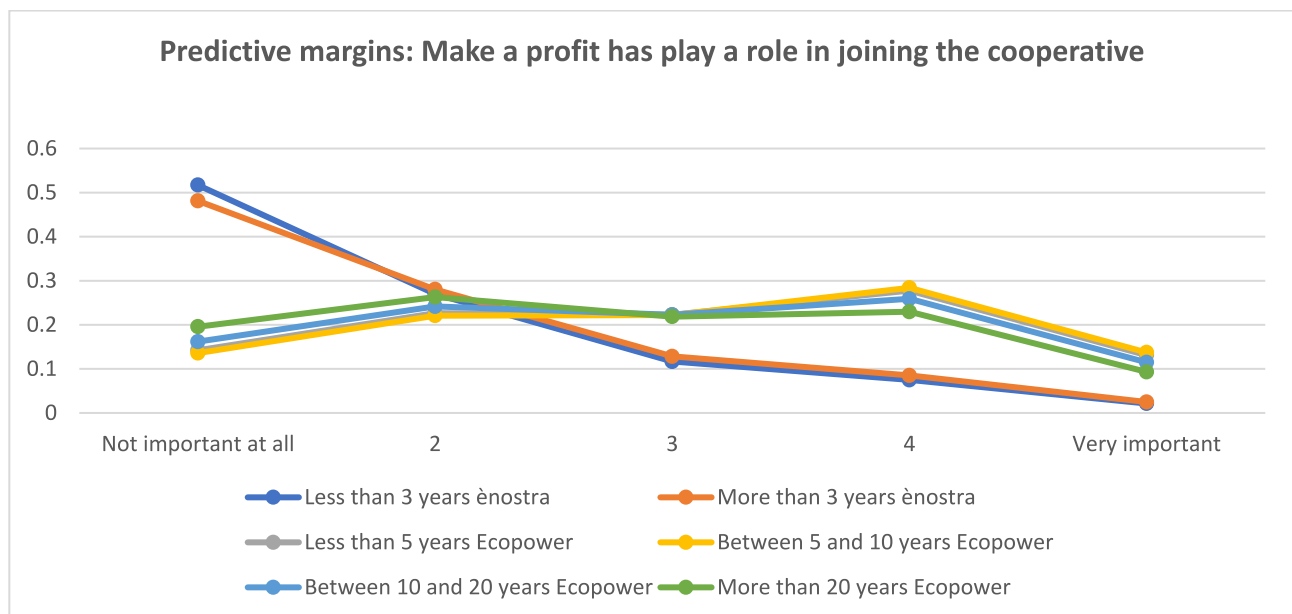


Fig. 4. Predictive margins: importance of making a profit for members (with 95 CIs).

particularly inclined towards the idea of capitalizing on their investments, as noted by one member who had recently joined the cooperative: “It’s also just because my dad was also a member of Ecopower, and he also said he just got good money and dividends from his financial decision” (interview with Ecopower member).

Ecopower’s board acknowledges that to avoid veering towards market-oriented tendencies, the cooperative has instituted measures to curb the influence of capital interests. “Initially, with our wind turbines operational since 2001, we offered 6% dividends for 11 years, which naturally attracted capital investors. To counter this, we capped individual shareholding first to 50 shares of €250 each and eventually to just 20. Today, 75% of our members hold only a single share, reflecting their indifference to dividends” (Ecopower executive staff member).

This approach is reflective of a deliberate anti-capitalist ethos espoused by both cooperatives. The leadership at Ecopower and ènostra consistently emphasizes their commitment to a political vision that challenges traditional economic hierarchies. “We strive for fair electricity pricing, devoid of excessive mark-ups. Our cooperative doesn’t pursue surplus profits to benefit shareholders” (Ecopower staff member). Similarly, a staff member from ènostra stated: “ènostra was created to empower citizens within an energy system that is otherwise hierarchical and externally imposed.” This statement underlines the dedication of both cooperatives to envisioning energy not merely as a private commodity but as a resource managed in a manner that distributes power and benefits more equitably across the population.

However, in this item again, differences can be seen between the members of the two cooperatives, as shown by Fig. 5. The concept of common good is much more emphasized by ènostra members than by those of Ecopower, with a median of 5 against 4, respectively. In ènostra, around 90 % of members agree or strongly agree with this, while for Ecopower the proportion is around 75 %, thus expressing a deep connection to the idea of “reclaiming energy with the possibility of forming some kind of community” (interview with ènostra member). Additionally, in both cooperatives, we note a growing tendency to recognize the importance of this concern. For instance, the percentage of those strongly agreeing with this principle is 55 % for established members with over three years of seniority compared to 64 % for those with less than three years. Similarly, in Ecopower, the figure is 29 % for those with over 20 years of seniority, contrasting with 35 % for those with less than five years (Table 6 in the Appendices).

#### 4.2. Mutual benefits

With regard to mutual benefits, the Mann-Whitney *U* test again yields significant results (*p*-value <0.000), indicating a difference between the two organizations (Table 5 in the Appendices). Specifically, it is observed that Ecopower members place greater emphasis on shared

objectives related to potential economic benefits for the members than ènostra members do. In both organizations, the mutual benefits, resulting in the production of clean and cost-effective energy for their members, are also more emphasized than the capital ones since the median score for Ecopower is 4, while for ènostra it is 3.

In Ecopower, a consistent trend is observed across cohorts, with approximately three-quarters of the members attaching great importance to the economic benefits of their participation (Fig. 6), such as lowering energy costs: “It was attractive in terms of costs because Ecopower was the cheapest in Belgium with 100% renewable energy” (interview with Ecopower member) and “I won’t stay in Ecopower if the prices triple” (interview with Ecopower member).

Ecopower’s response to the energy crisis and surging energy prices further illustrates its commitment to mutual benefits. Ecopower decided to stop admitting new clients, a decision that has been widely appreciated by its shareholders. This move was aimed at preserving the supply of green and locally sourced energy and avoiding the risk of increased costs: “During the energy crisis, there was a surge of people interested in joining Ecopower, primarily due to its cost-effectiveness. However, Ecopower quickly realized that it couldn’t accommodate all these newcomers as expanding wind energy capacity doesn’t happen overnight. As a shareholder, I’m pleased that they decided to temporarily stop new customers in line with their commitment to local renewable energy projects” (interview with Ecopower member).

In the case of ènostra, only a minority of the shareholders, approximately 40 %, give importance to mutual benefit, a trend that has also remained stable over time. This difference compared to Ecopower can be explained by the fact that, currently, ènostra only produces a small proportion of their members’ energy consumption, which does not allow it to provide the cheapest prices for their members: “I share the values and the aspirations of ènostra but I do not get great economic advantages from my participation” (interview with ènostra member).

In regard to the principle of one person, one voice, which is a fundamental aspect of mutuality since it prevents any single member from gaining undue control over others, the median of the variable “The members who have invested the most should have more power than the others” is 1 for ènostra compared to 2 for Ecopower.

On average, approximately 18 % of Ecopower members agree or strongly agree with the idea that those who invest more should have more decision-making power, whereas the percentage is almost 0 % for ènostra members (Fig. 7). However, for ènostra, we observed a strong difference between ènostra cohorts since new cohorts are more likely to disagree, but particularly to strongly disagree, with this assumption since 52 % of those who have been members for less than three years strongly disagree compared to 30 % of those who have been members for more than three years. For Ecopower, approximately half of the members disagree with this viewpoint, and this level remains consistent

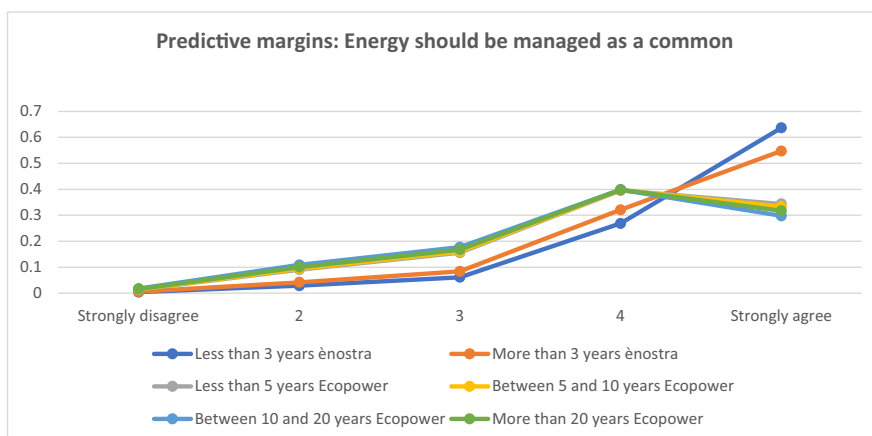


Fig. 5. Predictive margins of energy as a common (with 95 CIs).

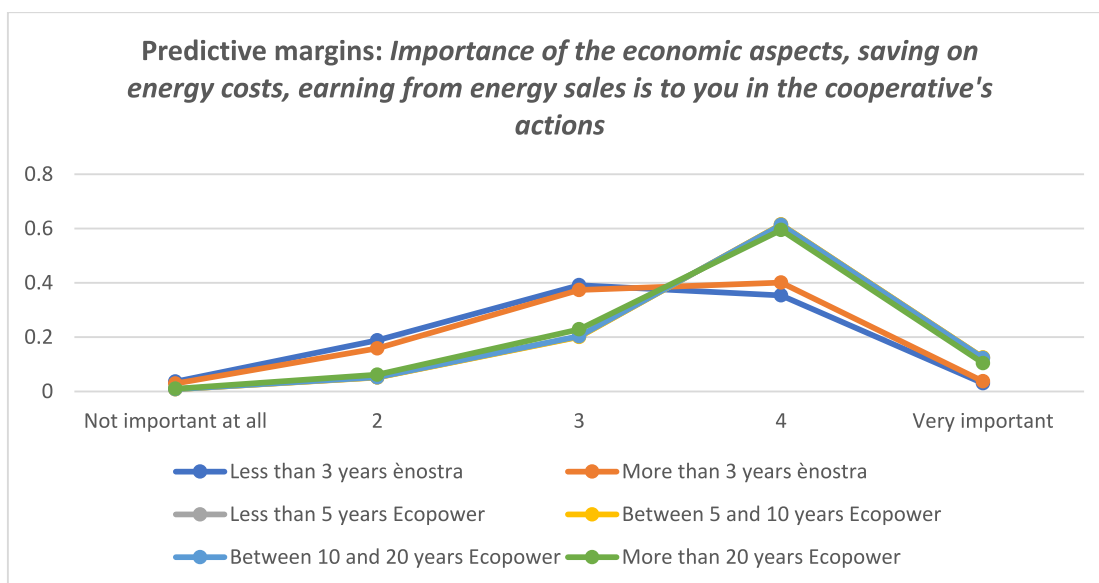


Fig. 6. Predictive margins of importance of economical benefits (with 95 CIs).

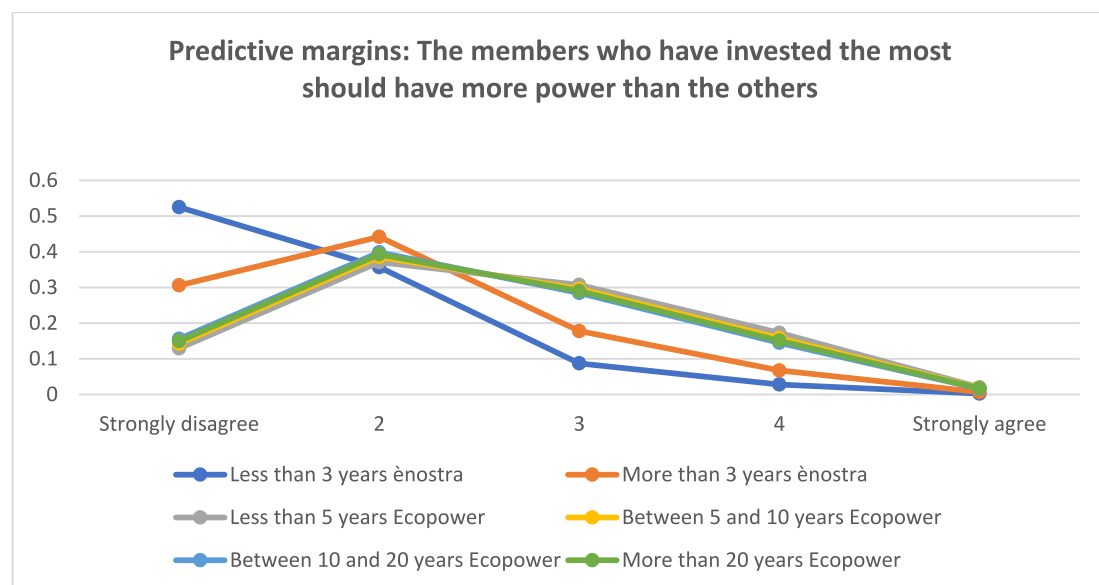


Fig. 7. Predictive margins of proportionality (with 95 CIs).

over time (Table 7 in the Appendices).

While ènostra remains committed to the principle of mutuality, the adoption of certain financing mechanisms for new energy installations has sparked questions about its adherence to reciprocity. As underlined, this investment model, which offers attractive energy rates, favours members who are able to invest a minimum of €500 (interview with ènostra members). Though the cooperative's long-term development will benefit all members (interview with ènostra executive), this approach introduces a tiered benefit system in the short term. Higher investments are rewarded with exclusive advantages, potentially creating a discrepancy between the cooperative's commitment to equal treatment of all members and the practical incentives favouring larger contributions.

### 4.3. General interest

Finally, we delved into the dimension of general interest, examining

how members and the board are inclined to allocate their residual benefits towards broader environmental and social objectives. With respect to environmental issues, in line with previous findings in the literature (Bauwens, 2016), nearly all members (95 %) express a strong environmental motivation to join the cooperatives. Indeed, the emphasis on this aspect remains notably high in both cooperatives, with the same median score of 5. Nevertheless, the Mann-Whitney *U* test maintains significance (Table 5 in the Appendices), primarily due to the variance in intensity of members' answers. Notably, 90 % of ènostra members strongly agree with this viewpoint compared to 57 % for Ecopower.

However, when it comes to having a social impact, the pattern differs, with a lower degree of emphasis among Ecopower members than among those of ènostra (Table 5 in the Appendices). In regard to the variable "Our cooperative should intervene in the poorest sections of the population to help reduce energy poverty", the median is 4 for ènostra and 3 for Ecopower. For the variable "I would like that the cooperative to focus on the inclusion of the poorest section of the population to help them to improve



their competences in energy management”, there are variations in how strongly members express their opinions between cooperatives (Mann-Whitney U test is significant), but in this case, the central tendency of the responses does not change significantly, achieving the same score of 4.

Specifically only 30 % of Ecopower members agree with the idea that the cooperative should act against energy poverty, with only 8 % strongly agreeing. In contrast, 42 % of ènostra’s members agree and 30 % strongly agree – a trend that is particularly pronounced among the youngest cohort, who score the highest, with 37 % strongly agreeing (Fig. 8). The variable of “including vulnerable people in cooperative management” is higher for Ecopower, with a greater emphasis among cooperative members since in this case 48 % vs 42 % for ènostra agree and 17 % strongly agree vs 45 % for ènostra (Fig. 9). Once again, in ènostra, the youngest cohort is more inclined to strongly agree with this approach: 34 % among those with more than three years of seniority against 52 % for those with less than three years, while for Ecopower the trend remains constant (Table 8 in the Appendices).

While ènostra members exhibit heightened awareness of cooperative values, it is Ecopower’s board that actively underscores the importance of social engagement, ensuring opportunities for all citizens to participate in the cooperative. Understanding the potential hurdles faced by those affected by energy poverty, Ecopower’s board has proactively set forth an agenda with specific actions aimed at identifying and surmounting these obstacles: “At Ecopower, we have what we call step lines, which outline our planned exercises for the next ten years. At least two of these steps are geared toward fostering inclusivity within the cooperative... We don’t want to limit membership to those who are well-off or highly educated; we also want to welcome people who are affected by energy poverty and similar challenges” (interview with Ecopower executive).

Conversely, in reference to ènostra: “In my opinion, the category of vulnerable consumers is one that ènostra has for the moment never directly engaged with, in the sense of implementing initiatives or actions aimed at it” (interview with ènostra executive). In particular, not all the staff and board members of ènostra fully understand or recognize the associated challenges. For example, when asked about the fact that a model of investment with an entrance fee may limit disadvantaged people, one staff member answered, “I don’t believe it’s a limitation”, while another member of the executive board perceived the cooperative as inherently inclusive due to its principle of openness to every citizen without discrimination: “The cooperative is destined for all social groups and is thus inclusive from the beginning, with the exception of speculators and nuclear proponents, who may not join, so it won’t be total inclusivity.” For those among the staff who are more aware of the necessity of dealing with the

issue, the problem is not a lack of willingness but rather insufficient resources and expertise to tackle this matter effectively.

#### 4.4. Control variables

As regards our control variables (Tables 6, 7, 8 in the Appendices), gender plays one of the most significant roles in the analysis, with our *p*-value, which is always significant for gender, indicating that women exhibit a greater commitment to general and mutual interests while placing less emphasis on capital interests. Despite the stronger presence of women in ènostra, interaction effects are not significant, showing that this holds true in both cooperative contexts. Educational attainment and age also prove to be significant factors, with individuals holding higher degrees and younger people being less inclined to support capital interests. For general benefits, those with higher degrees tend to emphasize environmental issues but do influence attitudes towards social issues. Contrary to our expectations, age emerges as a significant factor for social issues, with older individuals exhibiting a higher propensity to endorse social initiatives. As discussed in our interviews with members, this phenomenon may arise from a nuanced interplay between foresight, generational responsibility, and life experience.

Interestingly, in both entities, people that have invested the most are more likely to prioritize financial benefits but they do not clamour for more power, and this does not impact their willingness to engage with general-interest issues. Income is not significant for any variable. In terms of education, highly educated members of cooperatives tend to focus their motivations more on specific environmental issues rather than broader social concerns.

### 5. Discussion

As the present analysis has shown, both cooperatives align with an idealistic view of energy communities as catalysts for fairer access to sustainable energy and energy justice [89]. Nevertheless, we can observe different patterns between the two RECs. For Ecopower’s members, economic and financial interests play a significant role, reflecting a more mutual and market-oriented approach than that displayed by ènostra members. In Italy, ènostra members exhibit a stronger commitment to general interests, along with an increasing willingness to address these issues, and they are less attracted by mutual and capital interest.

To explain these differences, it is important to first underline the institutional context in which these two RECs evolve [73,90]. In Italy, a

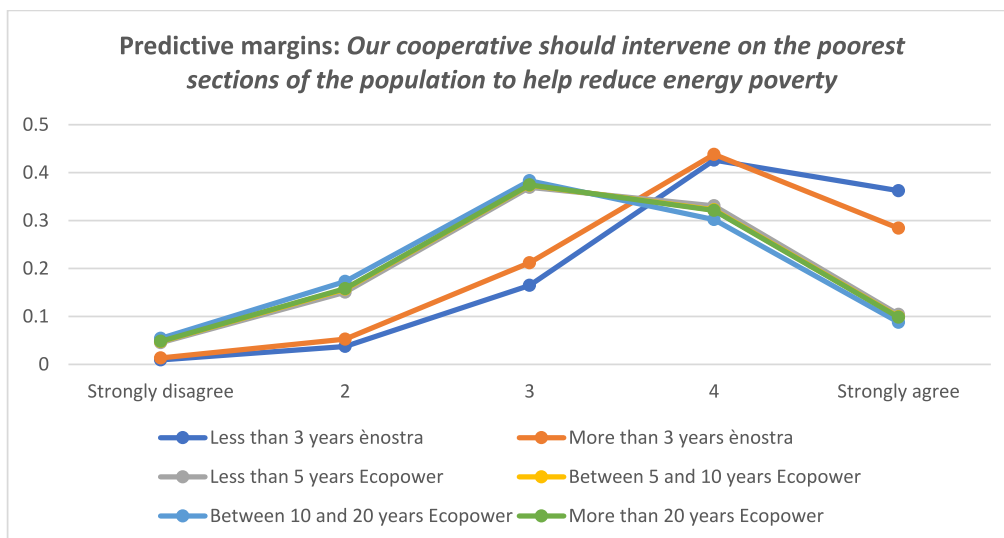


Fig. 8. Predictive margins of acting on poverty.

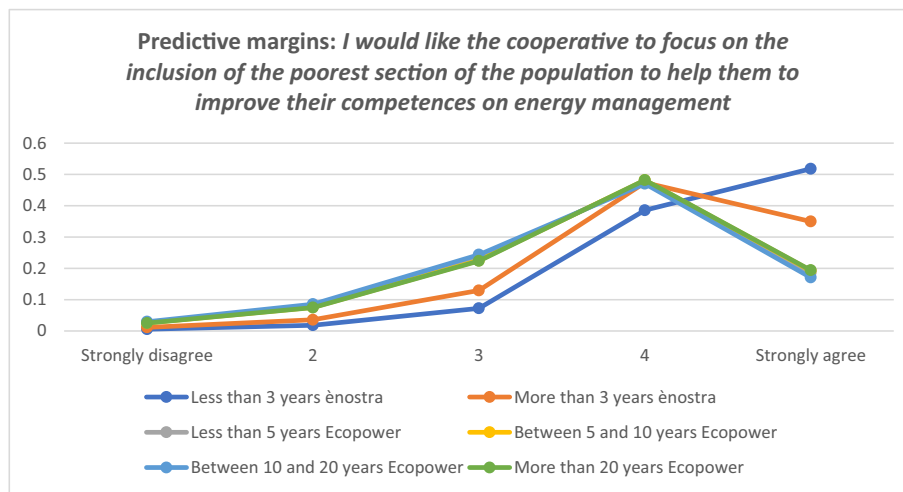


Fig. 9. Predictive margins of including the vulnerable citizens in the cooperative management.

### Electricity prices for household consumers - bi-annual data (from 2007 onwards)

Time frequency: **Half-yearly, semesterly** Products: **Electrical energy** Energy consumption: **Consumption from 2 500 kWh to 4 999 kWh - band DC** Unit of measure: **Kilowatt-hour** Taxes: **Excluding taxes and levies** Currency: **Euro**



This graph has been created automatically by ESTAT/EC software according to external user specifications for which ESTAT/EC is not responsible. General disclaimer of the EC website: [https://ec.europa.eu/info/legal-notice\\_en.html](https://ec.europa.eu/info/legal-notice_en.html)



Fig. 10. Energy prices for household consumers in Belgium and Italy.

shortfall in public/welfare services may force cooperatives to take on a role typically filled by the state, especially evident in addressing energy poverty [91]. As a result, members of cooperatives find themselves at the forefront, a circumstance made worse by the higher level of Italian energy poverty than that in Belgium and the risk that it could be exacerbated, especially with the end of the regulated market. Moreover, while previously energy prices were relatively high in Belgium, they were close to the European median in Italy. However, they are now sharply increasing, with Italy ranking among the countries where energy costs are highest (see Fig. 10). In contrast, at Ecopower, members perceive the general-interest mission of energy cooperatives as being more aligned with the state's role than that of the cooperatives themselves. Members are particularly concerned that blending the general-interest missions with cooperative objectives may lead to an overshadowing of the state's responsibility in reducing poverty [92]: *"It's the state's duty to ensure universal access to clean energy, and that this responsibility should not fall solely on individuals or cooperatives which have to self-organize"* (interview with Ecopower member).

Moreover, Ecopower's growth also demonstrates that pursuing the organization's interests first can align with addressing general societal interests, having reached an adequate level of resources to balance mutual and general interests. Focusing first on securing its business model has also been a way to ensure collective benefits, aligning with the "upwards" trajectory from cooperatives to develop general-interest missions as described by Defourny and Nyssens (2019) [93]. Thus, Ecopower follows the path of other cooperatives, such as Enercoop in France, which was created in 2005 and now has 93,500 members, and has established since 2017 a recognized public interest endowment fund, collaborating with associations focused on reducing energy poverty. In parallel, as Ecopower has strengthened its financial capacity, the REC is also able to actively work on empowering its members in social issues, raising awareness of the importance of tackling these challenges through its STEP 30 agenda to avoid a possible shift in the views of the members and the board.

In contrast, the board of ènostra, despite being confronted with heightened demands from its members, still grapples with the challenge of reaching a sustainable size. This highlights the urgent need for additional support and resources to tackle these social challenges effectively: *"The cooperative is indeed a social enterprise with a specific common good objective, but it is still a business. And then I agree that there are things that the state should, let's say, take care of and not leave to others. For example, all this awareness-raising that we do, it would be right that we were paid for it"* (interview with ènostra staff member).

Finally, our research also indicates that demographic factors significantly affect perceptions in the same way in both cooperatives, especially, as expected, since gender is one of the strongest predictors. Women appear to be much more concerned about general-interest issues than males, thereby reflecting the importance of addressing their underrepresentation in energy transition. As for age, contrary to our expectations, it is not the younger generation but older individuals who place greater emphasis on the issue. The lack of any significant influence of income and investment size on members' attitudes towards mutual and general interests in cooperatives suggests that members acknowledge the unique nature of these organizations. Here, a robust sense of community and shared responsibility takes precedence over individualistic and profit-driven motives [94].

These insights indicate that enhancing the effectiveness and sustainability of energy cooperatives could significantly contribute to advancing energy justice and addressing social challenges linked to energy. However, to realize this potential, policy interventions need to provide supportive measures.

First of all, as the study reveals, energy cooperatives often face resource constraints, expertise limitations, and awareness gaps when tackling complex challenges like energy poverty. Policymakers should consider offering tailored support to these cooperatives, including financial aid, capacity building, and knowledge sharing opportunities,

to enhance their ability to address broader societal issues. Expanding initiatives like the "Rural Energy Community Advisory Hub" could be particularly beneficial in this endeavour. Moreover, energy cooperatives with sustainable business models can easily and effectively balance mutual and general interests. Policymakers should support the creation and growth of such cooperatives, fostering an environment that enables them to thrive and contribute to broader societal objectives. This could involve the provision of incentives and regulatory support for cooperatives aiming to balance their economic, social, and environmental objectives, as well as the promotion of innovation.

As highlighted by our theoretical framework, we would also underline the importance of shifting towards the development of partnerships between energy cooperatives and public institutions in addressing energy poverty effectively. This collaborative approach between the public and the third sector could help ensure a more comprehensive understanding of the issues at hand and prevent the risk of neoliberalism, with the government disengaging from social issues [95,96]. Policymakers should therefore promote partnerships between these actors, fostering information sharing, joint initiatives, and integrated strategies to tackle the issue. In particular, the EU Solar Energy Strategy Communication (COM 2022/221), whose aim it is to establish at least one local renewable energy community in each municipality with over 10,000 residents by 2025 while emphasizing access to solar energy for energy-poor and vulnerable households, could be a way to give a role to energy cooperatives in supporting and helping public authorities in coordinating these initiatives, acting in this case as second-order energy communities [97].

Finally, the study reveals that women tend to be more concerned about general-interest issues than men, but they are also underrepresented in energy cooperatives. While efforts are already underway, such as the work done by the Gender group of REScoop.eu, policymakers should prioritize and support these initiatives by advocating the active involvement and leadership of women in energy cooperatives and associated decision-making processes. This may entail initiatives aimed at boosting women's representation in cooperative membership and leadership positions, alongside targeted outreach programmes and awareness campaigns.

## 6. Conclusion

Our findings highlight the importance of understanding, as underlined by Bauwens (2017) [98], energy produced by cooperatives as a joint product, serving a dual purpose. It yields collective benefits for the society but also provides private advantages for individual cooperative members in terms of (limited) dividends and energy prices. In particular, mutuality is a factor by which cooperatives can expand and be more efficient in acting and empowering their members to focus on general-interest issues. This is why we believe that energy cooperatives should be recognized as one of the pivotal contributors to the creation of a more equitable energy landscape. However, while acknowledging the goodwill and proactive engagement of these initiatives in creating a fairer energy landscape, it is not sustainable to depend entirely on their dedication for addressing general-interest missions, for two reasons: first, because RECs, in order to effectively tackle complex challenges like energy poverty, may lack the essential financial resources, expertise, and/or awareness to effectively tackle complex challenges such as energy poverty, thus impeding their ability to address broader societal issues; and second, as their core mission is centred on producing and distributing renewable energy, overburdening them with additional responsibilities could threaten their economic viability.

## CRedit authorship contribution statement

**Aurore Dudka:** Writing – review & editing, Writing – original draft, Validation, Software, Resources, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Natalia**

**Magnani:** Writing – review & editing, Validation, Supervision, Methodology. **Georgios Koukoufikis:** Writing – review & editing, Supervision, Methodology, Conceptualization.

interests or personal relationships that could have appeared to influence the work reported in this paper.

#### Declaration of competing interest

The authors declare that they have no known competing financial

#### Data availability

Data will be made available on request.

## Appendix A

**Table 1**

Members' repartition according to their seniority in their cooperatives.

Members' seniority	Ecopower
2016–2020	1120
2011–2015	964
2003–2010	2239
Before 2003	282

Members' seniority	Ènostra
Less than 3 years	172
More than 3 years	116

**Table 2**

Control variables' description (%).

Gender	Ecopower	Ènostra
Women	20.94	43.4
Men	79.06	56.6
Total	100	100

Income	Ecopower	Ènostra
Under the median income	11.21	15.64
Above the median income	88.79	84.36
Total	100	100

Study level	Ecopower	Ènostra
Lower school	1.05	3.85
Middle school	19.97	36.71
Professional bachelor	17.68	2.45
Academic bachelor	19.24	9.09
Master	37.27	35.31
Phd	4.8	12.59
Total	100	100

Age	Ecopower	Ènostra
18–30 years	1.39	2.78
31–40 years	13	17.01
41–50 years	23.93	25.35
51–60 years	26.2	31.6
61–70 years	24.81	15.63
>70 years	10.66	7.64
Total	100	100

Amount of investment	Ecopower	Ènostra
Minimum	64.27	37.26
Low	14.27	41.82
Medium high	17.13	14.44

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**Table 2** (continued)

Amount of investment	Ecopower	Enostr
Very high	4.32	6.46
Total	100	100

**Table 3**

List of interviews.

Name	Function
Interview 1	è nostra executive
Interview 2	è nostra shareholder
Interview 3	è nostra executive
Interview 4	è nostra administrator
Interview 5	è nostra administrator
Interview 6	è nostra administrator
Interview 7	è nostra administrator
Interview 8	è nostra administrator
Interview 9	è nostra shareholder
Interview 10	è nostra shareholder
Interview 11	è nostra engineer
Interview 12	Ecopower shareholder
Interview 13	Ecopower shareholder
Interview 14	Ecopower administrator
Interview 15	Ecopower shareholder
Interview 16	Ecopower administrator
Interview 17	Ecopower shareholder
Interview 18	Ecopower shareholder
Interview 19	Ecopower administrator
Interview 20	Ecopower executive

**Table 4**

Interview script.

Interview script for the members:

What are your main motivations (economic, environmental, social) for joining this cooperative?  
 As a shareholder, do you consider it important to receive dividends?  
 Did the electricity pricing influence your decision to join the cooperative?  
 Do you regularly participate in general meetings? Is democratic management of the cooperative important to you?  
 Many shareholders seem reluctant to include economically disadvantaged people in cooperative management or to act against energy poverty. Do you also think that energy justice is not a high priority?  
 How do you explain this viewpoint?  
 Are there any aspects of the cooperative's management that you find complex or difficult to understand?  
 Do you think that the public authorities in your country are sufficiently attentive to social issues? In your opinion, is it the cooperative's role to combat energy poverty?

Interview script for the executive board and the staff:

Can you please explain your philosophy regarding member participation in your cooperative? What expectations do you have of your members?  
 How important do you consider citizen participation within your cooperative model?  
 Do you believe there are additional measures that could be implemented to further engage members beyond current efforts?  
 Are you concerned that some individuals may join the cooperative primarily for financial gain rather than a genuine commitment to its principles?  
 Do you view the cooperative you're building as a means to counteract capitalism? How do you see it balancing against capitalist forces?  
 How do you manage the participation of new members and growing numbers within the cooperative? Have you observed any changes in the motivations of new cohorts of shareholders, particularly in terms of financial incentives?  
 Do you believe that individuals who have invested more for financial gain are less engaged in cooperative activities? Or do you find that they are equally committed despite their financial motivations?  
 Do you see your cooperative playing a role in addressing sustainability issues? How do you envision leveraging your cooperative's capabilities to promote equity in the energy sector?

**Table 5**  
Comparison between the two cooperatives.

Variables	Min	Max	Ecopower		ènostra		Mann-Whitney (p-value)
			Obs	Median p.50	Obs	Median p.50	
<i>The prospect of making a good investment has played a role in your decision to join the cooperative</i>	1	5	5114	3	288	1	<b>0.000</b>
<i>Energy should be managed by citizens as a common good and not as a private issue</i>	1	5	5114	4	288	5	<b>0.000</b>
<i>The importance of economic aspects, saving on energy costs, earning from energy sales, to you in the cooperative's actions</i>	1	5	5114	4	288	3	<b>0.000</b>
<i>The members who have invested the most should have more power than the others</i>	1	5	5114	2	288	1	<b>0.000</b>
<i>The prospect of having an environmental impact has played a role in your decision to join the cooperative</i>	1	5	5114	5	288	5	<b>0.000</b>
<i>Our cooperative should intervene in the poorest sections of the population to help reduce energy poverty</i>	1	5	5114	3	288	4	<b>0.000</b>
<i>I would like the cooperative to focus on the inclusion of the poorest section of the population to help them to improve their competences in energy management</i>	1	5	5114	4	288	4	<b>0.000</b>

\*p < 0.05; \*\*p < 0.01; \*\*\*p < 0.001 Confidence Interval in brackets.

**Table 6**  
Ordered logit model of the variables regarding capital interest.

	Capital interest	
	<i>The prospect of making a good investment has played a role in your decision to join the cooperative</i>	<i>Energy should be managed by citizens as a common good and not as a private issue</i>
Gender (ref. women)	<b>1.14**</b> (1.08, 1.39)	<b>0.80***</b> (0.70, 0.90)
Income (ref. under the median income)	0.95* (0.80, 1.12)	0.89 (0.76, 1.06)
Study level (ref. elementary)	<b>0.77***</b> (0.75, 0.82)	<b>0.91***</b> (0.87, 0.94)
Age (ref. 18–30)	<b>1.21***</b> (0.76, 0.82)	<b>1.15***</b> (1.10, 1.20)
Seniority (ref. <5 years Ecopower)		
Less than 3 years ènostra	<b>0.14***</b> (0.1, 0.2)	<b>3.42***</b> (2.35, 5.00)
Between 5 and 10 years Ecopower	1.05 (0.93, 1.3)	0.96 (0.81, 1.12)
More than 3 years ènostra	<b>0.16***</b> (0.16, 0.36)	<b>2.37***</b> (1.56, 3.60)
Between 10 and 20 years Ecopower	0.85 (0.83, 1.10)	0.80** (0.69, 0.93)
More than 20 years Ecopower	0.67** (0.67, 0.95)	0.88 (0.67, 0.97)
Amount of investment	<b>1.19***</b> (1.15, 1.26)	0.97 (0.95, 1)

\*p < 0.05; \*\*p < 0.01; \*\*\*p < 0.001 Confidence Interval in brackets.

**Table 7**  
Ordered logit model of the variables regarding mutual interest.

	Mutual interest	
	<i>The importance of the economic aspects, saving on energy costs, earning from energy sales, to you in the cooperative's actions</i>	<i>The members who have invested the most should have more power than the others</i>
Gender (ref. women)	<b>1.37***</b> (1.16, 1.53)	<b>1.38***</b> (1.22, 1.57)
Income (ref. under the median income)	1.04 (0.89, 1.28)	1.18* (1.00, 1.39)
Study level (ref. elementary)	1.03 (0.99, 1.06)	1.02 (0.98, 1.06)
Age (ref. 18–30)	0.99 (0.96, 1.04)	1.06** (1.01, 1.10)
Seniority (ref. <5 years Ecopower)		
Less than 3 years ènostra	<b>0.22***</b> (0.15, 0.31)	<b>0.13***</b> (0.09, 0.18)
Between 5 and 10 years Ecopower	1.01 (0.84, 1.21)	0.89 (0.76, 1.05)
More than 3 years ènostra	<b>0.28***</b> (0.18, 0.43)	<b>0.33***</b> (0.22, 0.51)
Between 10 and 20 years Ecopower	0.98 (0.85, 1.14)	0.79** (0.69, 0.91)

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Table 7 (continued)

	Mutual interest	
	<i>The importance of the economic aspects, saving on energy costs, earning from energy sales, to you in the cooperative's actions</i>	<i>The members who have invested the most should have more power than the others</i>
More than 20 years Ecopower	0.82** (0.70, 1.03)	0.84 (0.77, 1.09)
Amount of investment	1.05** (1.01, 1.08)	<b>0.93***</b> (0.91, 0.96)

\*p < 0.05; \*\*p < 0.01; \*\*\*p < 0.001 Confidence Interval in brackets.

Table 8

Ordered logit model of the variables regarding general interest.

	General interest		
	<i>The prospect of having an environmental impact has played a role in your decision to join the cooperative</i>	<i>Our cooperative should intervene in the poorest sections of the population to help reduce energy poverty</i>	<i>I would like the cooperative to focus on the inclusion of the poorest section of the population to help them to improve their competences in energy management</i>
Gender (ref. women)	<b>0.62***</b> (0.51, 0.69)	<b>0.62***</b> (0.54, 0.70)	<b>0.70***</b> (0.63, 0.81)
Income (ref. under the median income)	0.97* (0.85, 1.24)	0.86 (0.73, 1.02)	1.11 (0.94, 1.32)
Study level (ref. elementary)	<b>1.26***</b> (1.20, 1.32)	0.97 (0.93, 1.01)	0.99 (0.96, 1.04)
Age (ref. 18–30)	<b>0.91***</b> (0.86, 0.95)	<b>1.26***</b> (1.21, 1.32)	<b>1.17***</b> (1.12, 1.22)
Seniority (ref. <5 years Ecopower)			
Less than 3 years	<b>12.01***</b> (5.56, 26.29)	<b>5.06***</b> (3.57, 7.18)	<b>4.78***</b> (3.7, 6.92)
Between 5 and 10 years Ecopower	0.89 (0.74, 1.07)	0.95 (0.80, 1.11)	1.05 (0.88, 1.24)
More than 3 years	<b>3.83***</b> (2.14, 6.86)	<b>3.49***</b> (2.23, 5.15)	<b>2.37***</b> (1.50, 3.55)
Between 10 and 20 years Ecopower	0.99 (0.85, 1.16)	0.83** (0.72, 0.95)	0.9 (0.78, 1.03)
More than 20 years Ecopower	1.41** (1.05, 1.88)	0.94 (0.73, 1.19)	1.05 (0.81, 1.35)
Amount of investment	1.04** (1, 1.08)	0.94** (0.91, 0.97)	0.98 (0.95, 1.01)

\*p < 0.05; \*\*p < 0.01; \*\*\*p < 0.001 Confidence Interval in brackets.

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