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Energy Citizenship: Revealing the Intrinsic Motivational Factors Suggested by Self-Determination Theory

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Abstract: This study investigated the motivational factors driving energy citizenship through the lens of self-determination theory. Utilizing data from a survey of 749 respondents, we examined the role of intrinsic and extrinsic motivations in predicting energy citizenship. Our findings reveal that intrinsic motivations, such as personal responsibility for climate change, community involvement, and the desire to reduce one's carbon footprint, significantly predict engagement in energy citizenship. Conversely, extrinsic motivations, including financial incentives and external pressures, were not significant predictors. The study underscores the importance of intrinsic motivations in fostering sustained pro-environmental behaviours, particularly as the complexity of these behaviours increases. These insights suggest that policymakers should focus on enhancing intrinsic motivations through education, community engagement, and autonomy-supportive initiatives to promote active participation in sustainable energy practices.

Keywords: energy citizenship; motivation; self-determination theory

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1. Introduction

The energy system is undergoing a profound transformation, characterized by increasing decentralization, liberalization, democratization, and a shift towards greener energy sources [1–3]. This transition is redefining the roles of individuals within the energy landscape, positioning them not just as passive consumers but as active participants in energy production, consumption, and distribution. Individuals now have the agency to select their energy providers, become energy producers through means such as solar panels and other renewable technologies, and, in some cases, engage in energy distribution. This evolving dynamic underscores the growing significance of energy citizenship, where individual actions and decisions are crucial in shaping the future of the energy system.

However, during the last few years, household energy expenses in Latvia have risen, with costs for electricity and natural gas increasing markedly starting from 2021. By September 2022 the mean electricity cost had more than doubled from 16 EUR in 2020 to nearly 40 EUR per 100 kWh [4]. The large increases were essentially the outcome of increasing wholesale electricity prices, driven by inflated costs for natural gas in Europe that have been further deepened by energy market disruptions. Subsidies and price caps adopted by the Latvian government from October 2022 to April 2023 relieved these pressures to some extent, but electricity prices remained high compared with their levels before 2021 [4].

At the same time, the concept of energy citizenship has garnered considerable scholarly attention in Latvia and globally, reflecting its critical role in the broader energy transition [5–7]. The concept is closely linked to public participation, responsibility, equity and justice combining social and environmental goals [8]. Thus, the concept is inherently interdisciplinary, bridging psychological, environmental, and political domains, but the

term 'citizenship' itself is rooted in political science. Citizenship involves not only individual rights and responsibilities but also active participation in shaping collective decisions, especially in democratic contexts [9].

Research has identified different types of energy citizenship starting from individual to collective (e.g., environmental movements) and from reformative to transformative, aiming for the fundamental change in the energy system [10] and has increasingly focused on understanding what drives individuals to engage actively with the energy system and assume the responsibilities of energy citizens. Papers highlight the role of emerging technologies such as e-mobility, smart energy systems, and household energy technologies that play a significant role in promoting energy citizenship [11]. Education and climate awareness as well as financial incentives and investment opportunities are also crucial for fostering energy citizenship, e.g., through the energy communities [12]. Energy citizenship can also manifest through advocacy and activism, where individuals work to influence decision-making and policies to promote renewable energy and energy efficiency and sufficiency [13].

Despite this growing body of work, there remains a need to delve deeper into the motivational factors that underpin energy citizenship and determine whether individuals will sustain their engagement in the future. Given recent changes to consumer economics, it is critical that we understand how increasing costs of energy have altered the drivers for participation in prospective energy citizens. Eventually, financial pressure may force more of us to strive for energy independence with renewables and practice energy-saving techniques. At the same time, other intrinsic motivations, such as dissatisfaction with policymakers' insufficient actions or an increased sense of personal responsibility for climate change, may have intensified as the consequences of inaction become more visible. Determining the evolution of these motivational factors in relation to economic pressures is essential for designing policies that promote more engaged and proactive energy citizens.

This paper aims to explore the motivational factors that drive energy citizenship by applying the self-determination theory (SDT). Specifically, it seeks to address the research question: What are the intrinsic and extrinsic motivational factors that influence individuals to be energy citizens, and will energy citizens continue to see themselves as energy citizens in the near future? By examining these factors, the study hopes to contribute to a more nuanced understanding of the motivations behind energy citizenship and provide insights that can inform policies and initiatives to foster sustained individual engagement in the evolving energy system.

2. Theoretical Framework

Self-determination theory was developed by Richard Ryan and colleagues and provides a theoretical foundation for studying motivational factors [14]. The theory is based on the premise that individuals possess three innate psychological needs—competence, autonomy, and relatedness—which are essential for human well-being and thriving [15,16]. However, the regulatory environment can undermine a person's intrinsic motivation. For instance, an unpredictable or controlling environment may diminish an individual's overall ability to act with intrinsic motivation [16–18].

SDT distinguishes between the motives for engaging in a particular behaviour and the types of goals that an individual pursues through this behaviour [19]. An individual might be motivated to engage in a certain behaviour because they want to—that is, as a result of choice. For instance, a person may be more motivated to participate in energy-saving practices or community energy initiatives if they believe these actions will benefit society at large. Alternatively, they may feel that they have to engage in this behaviour, because of some pressure (whether exerted internally or externally, e.g., legal coercion, or guilt). This has been referred to as the 'why' of behaviour.

SDT also examines the types of goals that drive individuals' engagement in energy citizenship behaviours, distinguishing between 'intrinsic' and 'extrinsic'. Intrinsic goals include fostering personal growth, enhancing community connections, and contributing to

sustainability—these goals are inherently rewarding and align with satisfying fundamental psychological needs. In contrast, extrinsic goals (external regulation, introjected regulation, identified regulation, and integrated regulation [20]), such as gaining recognition or financial rewards, are less directly related to satisfying intrinsic psychological needs. Instead, the satisfaction from extrinsic goals relies on external validation and acknowledgement from others [21].

Research suggests a connection between the 'why' (process) and 'what' (content) of behaviour, with motivations for pro-environmental actions existing on a continuum of 'self-determination'. On this continuum, intrinsic motivation represents the highest level of self-determination, followed by various forms of extrinsic motivation (e.g., introjection), and amotivation, which indicates the lowest level of self-determination due to a lack of personal control. Studies indicate that higher levels of self-determination are more strongly associated with pro-environmental behaviour, especially as the complexity of the behaviour increases [22,23]. In other words, intrinsic motivations arising from an individual's sense of self are more likely to drive pro-environmental actions, particularly for more challenging environmental behaviours. Conversely, motivations driven by external rewards or internalised external pressures, such as concerns about self-esteem, are less likely to foster pro-environmental behaviour.

Research in SDT shows that engaging in activities driven by 'intrinsic' values—such as personal growth, emotional intimacy, or community involvement—tends to result in more energetic and sustained effort compared to activities motivated by 'extrinsic' values, like acquiring material goods, achieving financial success, or gaining social recognition [19]. This finding could be crucial for strategies that promote pro-environmental behaviour, as it highlights the significance of the underlying values driving behavioural change in influencing how committed and persistent an individual will be in adopting new, environmentally friendly behaviours.

SDT has been applied across a variety of disciplines to study human motivation and behaviour including educational psychology [24,25], work and organizational psychology [26,27], marketing and consumer behaviour [28,29], parenting and child development [30,31], as well as in studying pro-environmental behaviour [22,32,33]. In this paper, we apply the SDT to study energy citizenship.

3. Materials and Methods

3.1. Sample Characteristics

This study utilized a representative public opinion survey to examine energy citizenship across Latvia. A total of 749 respondents from Latvia completed the survey. Out of these, 49.7% were female, reflecting a nearly balanced gender representation. One respondent preferred not to disclose their gender, and another respondent identified as 'other', highlighting a small but important inclusion of diverse gender identities.

In terms of age distribution, the majority of participants (37.9%) fell into the 30–49 years age group, indicating a significant representation of middle-aged adults. The second-largest age group was 50–64 years, comprising 27.5% of the respondents, suggesting a strong presence of late middle-aged individuals. Participants aged 65 years and older accounted for 22%, showing substantial involvement from older adults. Lastly, the youngest age group, 18–29 years, made up 12.6% of the respondents, representing the perspectives of young adults.

This demographic breakdown provides a comprehensive view of the diverse population engaged in the survey, encompassing a wide range of ages and a balanced gender distribution. Including various age groups allows for a more nuanced understanding of the factors driving energy citizenship across different stages of life. However, the focus on Latvian respondents highlights how cultural and social factors specific to Latvia shape intrinsic motivations related to energy citizenship.

3.2. Procedure

Participants were recruited through online methods using quota sampling and a panel that was sufficiently diverse to best match the representativeness of the country. The panel was also large enough to ensure that hard-to-find target groups were reached, and potential source bias was eliminated. Data collection spanned from 1 October to 17 November 2023, allowing ample time for recruitment and ensuring a sufficient number of responses. This approach ensured that the sample reflected the demographic diversity of the population, including variations in age, gender, education, income, and geographical location.

Prior to participation, respondents were informed about the study's objectives, the voluntary nature of their participation, and the anonymity of their responses. Detailed information was provided about the purpose of the research, how the data would be used, and the measures taken to protect their privacy.

The survey was designed and distributed using an online platform, which facilitated easy access and completion at the respondents' convenience. The online format also enabled the research team to efficiently manage and monitor data collection, ensuring high-quality and reliable data.

All collected data were stored securely, with access limited to the research team. The data were anonymized to protect the identities of the respondents, adhering to ethical standards and data protection regulations. Specific measures included encrypting the data and using secure servers for storage. These steps ensured that participants' privacy was maintained and that the data collected were handled responsibly and ethically.

3.3. Measures

The survey used in this research is part of a broader Horizon Europe project EnergyPROSPECTS which works with a critical understanding of energy citizenship. The survey consisted of structured questions divided into four parts:

1. Energy-related activities: This section focused on participants' engagement with various energy-related behaviours and practices. It included 5 main questions and 39 sub-questions, aiming to capture a comprehensive picture of the respondents' actions and habits concerning energy consumption, production, and distribution.
2. Views about the role of individuals in the energy system: This part explored participants' opinions on how individuals can and should participate in the energy system. It contained 3 main questions and 23 sub-questions, examining their beliefs about individual responsibilities, opportunities for involvement, and potential impacts on the energy system.
3. Views about the energy system and the underlying values: This section delved into participants' perspectives on the broader energy system and the values that underpin it. It consisted of 6 main questions and 49 sub-questions, addressing topics such as sustainability, equity, innovation, and the future of energy systems.
4. Demographic information about the participants: The final part gathered demographic details to contextualize the responses. It included 7 questions, covering aspects like age, gender, education, income, and geographical location.

Given the breadth of the survey, we focus here only on the specific measures most relevant to our research question. We structured the survey to balance comprehensiveness with clarity to yield meaningful insights and describe the questions used in this study in the following subsections.

3.3.1. Energy Citizenship

Energy citizenship was assessed using a self-adapted scale consisting of five statements:

1. I am a member of a renewable energy cooperative (a local community or citizens' initiative to produce and consume renewable energy).
2. I often try to mobilise the people I know to be more responsible in the way they consume energy.

3. I comment on energy-related issues on online social media (e.g., Facebook, Twitter/X, online forums).
4. I am active in an organisation that seeks social, political, or societal change related to the energy system (a social movement).
5. I participate in protests against certain types of energy production (wind/nuclear/coal).

Each statement had the following answer options: 1 = No, and I have no plans to do it in the future, 2 = No, but I may do it in the future, 3 = No, but I will certainly do it in the future, 4 = I have done it before, but not anymore, 5 = Yes, I am doing it. The mean score was calculated for the energy citizenship scale, with higher scores representing higher levels of energy citizenship. The scale showed acceptable internal consistency ($\alpha = 0.789$ and $\omega = 0.789$).

3.3.2. Willingness to Be an Energy Citizen in the near Future

The willingness to be an energy citizen in the near future was assessed using a self-adapted scale that consists of four items:

1. I can see myself participating in public debates and consultations, deliberative processes, and referendums focused on energy.
2. I can see myself joining a citizen-based organisation or other collective form of citizen engagement.
3. I can see myself participating in social movements such as demonstrations and protests linked to various aspects of the energy/climate transition.
4. I can see myself voting for a political party or candidate that puts the energy transition in the centre.

All items were rated on a 5-point Likert scale (1—Strongly disagree and 5—Strongly agree). The mean score was calculated, with a higher score indicating a higher willingness to be an energy citizen in the near future. The scale showed good internal consistency ($\alpha = 0.840$ and $\omega = 0.846$).

3.3.3. Motivational Factor

To measure motivational factors, we used self-adapted statements, with each statement representing a different motivational factor.

Statements were as follows:

1. Recognition of my own responsibility for climate change. (MF-1).
2. Desire to contribute to the common good. (MF-2).
3. Inspiration by practices of somebody I trust. (MF-3).
4. Desire to increase self-sufficiency or to become energy independent. (MF-4).
5. Frustration due to inadequate action by decision-makers. (MF-5).
6. Availability of financial subsidies (e.g., funding for renovation, funding for campaigns, etc.). (MF-6).
7. Ambition to reduce my carbon footprint (individual and of my household). (MF-7).
8. Possibility to earn or save money. (MF-8).

Each statement was rated as follows: 1 = Not important at all, 2 = Slightly important, 3 = Moderately important, 4 = Important, 5 = Very important. A higher score represents higher motivation.

3.4. Analysis Strategy

We conducted all analyses using the free-access software JASP, version 0.18.3 [34]. To investigate the linear relationship between variables, we used Pearson's correlation. For predictive analysis, we applied linear regression with the enter method. Principal component analysis was utilized to group motivational factors. To conduct regression analysis with latent variables, we used structural equation modelling with the maximum likelihood estimation method, as this method is robust and provides accurate parameter estimates under a variety of conditions [35].

For structural equation modelling fit indices, we followed Hooper and colleagues [36] provided guidelines: root mean square residual (SRMR) < 0.08; root mean square error of approximation (RMSEA) < 0.07; Tucker–Lewis index (TLI) > 0.95; normed fit index (NFI) > 0.95, and confirmatory fit index (CFI) > 0.95.

4. Results

The descriptive statistics provided in Table 1 demonstrate the distribution characteristics of several key variables associated with energy citizenship. Based on the skewness (S) and kurtosis (K) values, the data for these variables generally approximate a normal distribution, as indicated by their relatively low skewness and kurtosis. Skewness values near zero suggest that the data distribution is symmetrical, while kurtosis values close to zero indicate a distribution that is neither too peaked nor too flat compared to a normal distribution.

Table 1. Descriptive statistics.

Variable	M	SD	Min	Max	S	K
Energy citizenship	1.793	0.890	1.000	5.000	1.418	1.699
Willingness to be an energy citizen	2.498	0.847	1.000	5.000	0.144	−0.279
MF-1	2.992	1.135	1.000	5.000	−0.226	−0.756
MF-2	3.043	1.051	1.000	5.000	−0.265	−0.661
MF-3	2.774	1.123	1.000	5.000	−0.133	−0.915
MF-4	3.389	1.091	1.000	5.000	−0.407	−0.430
MF-5	3.414	1.068	1.000	5.000	−0.434	−0.338
MF-6	3.535	1.145	1.000	5.000	−0.615	−0.330
MF-7	2.892	1.171	1.000	5.000	−0.234	−0.941
MF-8	4.134	0.937	1.000	5.000	−1.080	0.859

Note. M—mean, SD—standard deviation, S—skewness, K—kurtosis.

For the variable energy citizenship, the mean is 1.793, with a standard deviation of 0.890, suggesting some variability in responses but generally clustering around the lower end of the scale. The skewness (S = 1.418) and kurtosis (K = 1.699) values are somewhat higher than the other variables, indicating a moderate positive skew and a more peaked distribution. This suggests that the majority of respondents reported lower levels of energy citizenship.

The variable willingness to be an energy citizen has a mean of 2.498 (SD = 0.847), with skewness (S = 0.144) and kurtosis (K = −0.279) values close to zero, indicating a nearly symmetrical and normal distribution. Respondents are more evenly distributed along the scale for this variable, with slightly more responses toward the higher end of the scale.

For the eight motivational factors (MF-1 through MF-8), the means range from 2.774 to 4.134, indicating varying levels of agreement or endorsement among respondents. Most skewness and kurtosis values for these factors are close to zero, with only a few showing notable deviations. MF-8 has the highest mean (M = 4.134), suggesting stronger agreement, and is characterized by a negative skew (S = −1.080), indicating a concentration of responses at the higher end of the scale. Its kurtosis value (K = 0.859) suggests a slightly more peaked distribution, meaning that the data are more concentrated around the mean.

In addition to the descriptive statistics, Table 2 presents the linear relationships between the variables. As expected, almost all correlations are statistically significant, given the relatively related nature of the concepts underlying the variables. Thus, our data are suitable for further analysis. These significant relationships suggest strong associations between the variables. For instance, the correlation between energy citizenship and willingness to be an energy citizen is notably high (r = 0.564), indicating that individuals with a higher sense of energy citizenship are more willing to actively engage in related behaviours.

Several motivational factors also exhibit strong correlations with energy citizenship and willingness. These correlations underscore the complexity of motivations for energy citizenship, with intrinsic factors such as personal responsibility, social influence, and ethical concerns playing a more significant role than purely financial or extrinsic incentives.

The significant relationships across motivational factors (e.g., the strong correlation between MF-1 and MF-2, r = 0.765) further suggest that pro-environmental behaviours are often driven by a combination of interconnected intrinsic motivations, reinforcing the need for policies that emphasize community engagement, ethical responsibility, and personal growth over financial rewards.

Table 2. Linear relationships between variables.

Variable	1	2	3	4	5	6	7	8	9
1. Energy citizenship	—								
2. Willingness to be an energy citizen	0.564 ***	—							
3. MF-1	0.245 ***	0.288 ***	—						
4. MF-2	0.291 ***	0.344 ***	0.765 ***	—					
5. MF-3	0.362 ***	0.358 ***	0.598 ***	0.612 ***	—				
6. MF-4	0.222 ***	0.225 ***	0.451 ***	0.444 ***	0.489 ***	—			
7. MF-5	0.163 ***	0.172 ***	0.234 ***	0.215 ***	0.238 ***	0.361 ***	—		
8. MF-6	0.125 ***	0.183 ***	0.355 ***	0.361 ***	0.319 ***	0.439 ***	0.386 ***	—	
9. MF-7	0.316 ***	0.323 ***	0.672 ***	0.624 ***	0.618 ***	0.437 ***	0.282 ***	0.397 ***	—
10. MF-8	−0.022	0.017	0.245 ***	0.222 ***	0.246 ***	0.361 ***	0.279 ***	0.409 ***	0.287 ***

Note. *** $p < 0.001$.

Further, to investigate whether motivational factors predict energy citizenship, we conducted a regression analysis with the enter method (see Table 3). The regression model was statistically significant, F(8, 748) = 20.180, $p < 0.001$, and explained 17% of the variance of energy citizenship. The results indicated that among all the variables, only MF-2, MF-3, MF-5, MF-7, and MF-8 significantly predicted energy citizenship. Notably, MF-8 significantly but negatively predicted energy citizenship, indicating that an increase in MF-8 (the possibility to earn or save money) leads to a decrease in energy citizenship. This suggests that monetary incentives alone may not encourage active energy citizenship and could detract from intrinsic or ethical motivations.

Table 3. Linear regression predicting energy citizenship.

Predictor	Coefficient (B)	Standard Error	Standardized Coefficient (Beta)	*t*	*p*	95% CI	
						Lower	Upper
MF-1	−0.076	0.045	−0.097	−1.716	0.087	−0.164	0.011
MF-2	0.093	0.047	0.110	1.989	0.047	0.001	0.184
MF-3	0.197	0.037	0.248	5.256	<0.001	0.123	0.270
MF-4	0.050	0.035	0.061	1.440	0.150	−0.018	0.118
MF-5	0.073	0.031	0.088	2.346	0.019	0.012	0.134
MF-6	−0.011	0.032	−0.014	−0.349	0.727	−0.074	0.051
MF-7	0.124	0.038	0.163	3.263	0.001	0.049	0.198
MF-8	−0.162	0.036	−0.171	−4.531	<0.001	−0.233	−0.092

Prior to the structural equation modelling analysis, we conducted a principal component analysis (PCA) in order to group motivational factors. This step was necessary to identify the underlying structure of the motivational factors and later to create latent variables with them in structural equation modelling.

Before conducting PCA we assessed the suitability of our data using Kaiser–Meyer–Olkin and Bartlett's tests. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was calculated to assess the suitability of our data for factor analysis. The overall KMO value was 0.864 and individual KMO values for the items ranged from 0.824 to 0.898. Bartlett's test of sphericity test was significant, $\chi^2(28.000) = 2446.123$, $p < 0.001$, suggesting that the correlations between items are sufficient for PCA.

The initial unrotated solution revealed that there were two factors which had eigenvalues greater than 1, explaining 49.2% (factor 1) and 15.1% (factor 2) of the variance, with a total variance explained of 64.3%. After applying promax rotation, two factors ex-

plained 38.8% (factor 1) and 25.5% (factor 2) of the variance, maintaining the total variance explained at 64.3%. Table 4 provides the loadings of each item on the identified factor.

Table 4. Principal component analysis item loadings.

Items	Factor 1	Factor 2
Recognition of my own responsibility for the climate change.	0.913	
Desire to contribute to the common good	0.917	
Inspiration by practices of somebody I trust.	0.811	
Desire to increase self-sufficiency or to become energy independent.		0.508
Frustration due to inadequate action by decision-makers		0.780
Availability of financial subsidies (e.g., funding for renovation, funding for campaigns, etc.).		0.739
Ambition to reduce my carbon footprint (individual and of my household).	0.794	
Possibility to earn or save money.		0.788

Factor 1 was labelled "Personal and Social Motivations", comprising items that represent intrinsic motivations, such as personal responsibility for climate change, social influence, and environmental concern. These motivations are closely tied to values of social responsibility and personal growth, consistent with the intrinsic motivations defined in SDT. Factor 2 was termed "Practical and External Motivations" and included items related to practical considerations, such as financial incentives, frustration due to external factors, and the availability of subsidies. These motivations are more aligned with external pressures and rewards, reflecting extrinsic motivations in SDT, which are less effective for fostering long-term pro-environmental behaviour.

Furthermore, we conducted structural equation modelling to investigate how these two factors predict energy citizenship, and in turn how energy citizenship predicts willingness to be an energy citizen in the near future (see Figure 1). The model was tested using the maximum likelihood estimation method and showed acceptable fit indices: CFI = 0.935, TLI = 0.911, NFI = 0.925, RMSEA = 0.088 [0.077–0.099], SRMR = 0.063 and $\chi 2$ (33) = 222.360, $p < 0.001$.

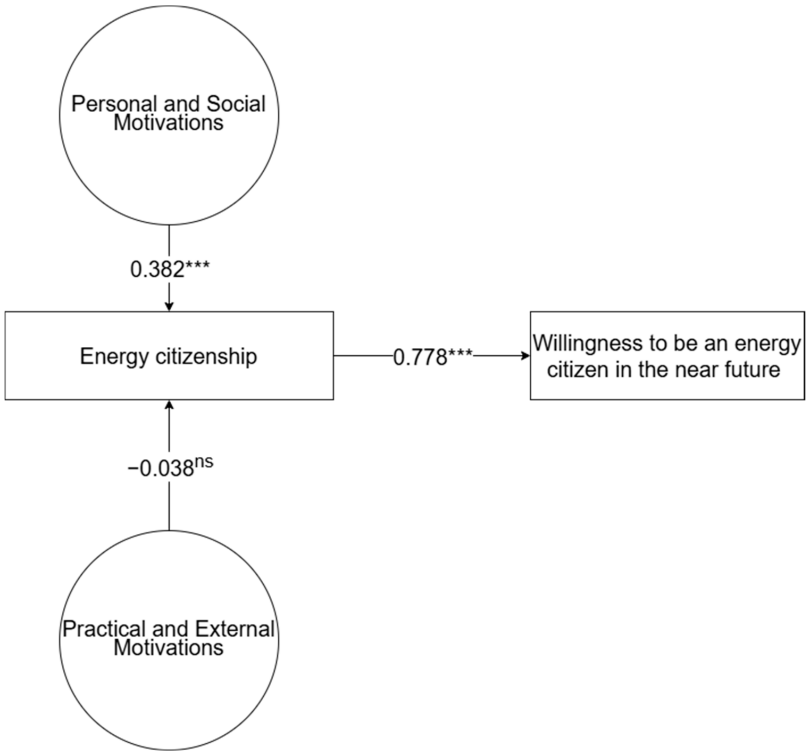


Figure 1. Structural equation modelling results. *** $p < 0.001$, ns—non-significant.

Results showed that only the "Personal and Social Motivations" positively and significantly predicted energy citizenship. In contrast, the "Practical and External Motivations" did not significantly contribute to predicting energy citizenship. This result suggests that intrinsic factors, such as personal responsibility and social influences, are more important drivers of energy citizenship than extrinsic factors like financial incentives or frustration with decision-makers.

In turn, energy citizenship was a significant and positive predictor of the willingness to be an energy citizen in the near future, indicating a feedback loop where individuals already engaged in energy citizenship are more likely to remain involved and motivated to continue their participation in pro-environmental behaviours.

The model explained 12.8% of the variance in energy citizenship and 31.9% of the variance in the willingness to be an energy citizen, underscoring the central role of intrinsic motivations in shaping long-term commitment to energy citizenship.

5. Discussion

In this study, we explored the motivational factors that influence active energy citizenship. The results reveal that motivations for engaging in energy citizenship are complex and multifaceted, spanning both intrinsic and extrinsic dimensions.

The study findings showed the important and significant role of intrinsic motivations in contributing to active energy citizenship. The "Personal and Social Motivations" factor—which consists of such elements as recognizing personal responsibility for climate change, a desire to contribute to the common good, inspiration from trusted individuals, and ambitions to reduce one's carbon footprint—emerged as a strong predictor of energy citizenship. Additionally, the findings showed that active energy citizens who are motivated by social and personal factors remain to see themselves as energy citizens in the near future. This is consistent with the principles of self-determination theory, which states that activities motivated by intrinsic motivation tend to be continued and repeated. This indicates that if we want to have active energy citizens in the future, we should focus on incentives that would motivate them with intrinsic goals. This supports the findings of Barszcz and colleagues [22], who demonstrated that intrinsic goals are positively associated with pro-environmental behaviour, while extrinsic goals often have a negative correlation.

Bonan and colleagues [37] further demonstrated that households are influenced to save energy by learning about their neighbours' energy use practices and receiving social approval for conservation. Terry, Hogg, and White [38], in their study, found that individuals who identify with groups that support recycling are more likely to engage in such behaviours, as group norms influence their behavioural intentions. Our findings are consistent with these studies, as we observed that "inspiration by practices of somebody I trust" significantly predicts active energy citizenship. This underscores the crucial role of social influence in motivating individuals to participate in pro-environmental behaviours and become active energy citizens. Social connections and trusted figures, therefore, act as important catalysts for spreading sustainable practices within communities.

Also, studies from Southern Europe [7] showed that individuals are motivated by a desire to contribute to the energy transition, focusing on energy savings, advancing energy justice, and reducing the carbon footprint. Trusted individuals' energy-saving behaviours can inspire others to adopt similar practices, thereby improving the overall efficacy of community-oriented energy conservation efforts. Energy communities represent a tangible form of community-based energy citizenship, with diverse motivations for participation. Research on energy communities [39] revealed that while some people are active participants, many of them engage informally but still benefit from the empowerment offered by the cooperative structure. Flexibility in engagement in this particular behaviour is an important key to fostering inclusivity, especially for those individuals who are less familiar with energy issues. This indicates that policies whose goal is to increase energy citizenship should take advantage of social networks and peer inclusion to maximize their effectiveness.

Furthermore, Chen [40] emphasize the importance of moral obligation in motivating pro-environmental behaviours. His work showed that people's moral obligation had a significant influence on their willingness to participate in energy-saving and carbon-reduction activities. Likewise, our work confirms this and indicates that the "desire to contribute to the common good" and "ambition to reduce my carbon footprint" are significant motivational factors associated with energy citizenship activities. Kotilainen and colleagues [41] also emphasize that energy sobriety and the ethical dimensions of energy citizenship are closely linked to both intrinsic and extrinsic motivations, showing the need for a socially inclusive and ethical approach to the energy transition.

Interestingly, our study also found that "frustration due to inadequate action by decision-makers" was a significant and positive predictor of active energy citizenship. This points out how frustration with institutional responses motivates individuals to take matters into their own hands. The research by Van Zomeren, Postmes, and Spears [42] suggests that perceived injustice or dissatisfaction may increase civic engagement as individuals seek to address issues unaddressed by authorities. Within the context of energy citizenship, individuals might be motivated to adopt energy conservation practices or participate in community-oriented energy initiatives when they perceive governmental efforts as inadequate in addressing climate change and energy transition crises.

Energy sobriety and the ethical aspects of energy citizenship are intricately linked to both intrinsic and extrinsic motivations, underscoring the need for a socially inclusive and ethical approach to the energy transition [41]. When individuals perceive that decision-makers are insufficiently addressing these concerns, frustration may serve as a driving force, motivating more involvement in energy-saving behaviours and participation in energy communities. This shows the significance of addressing both ethical and emotional aspects in fostering energy citizenship.

On the other hand, extrinsic factors—grouped under the "Practical and External Motivations"—did not significantly predict energy citizenship in our study. Notably, motivations such as the "possibility to earn or save money" were negatively associated with energy citizenship, while "availability of financial subsidies" was not a significant predictor. This finding contrasts with another study [43] that suggest financial incentives can positively impact energy conservation.

One possible explanation for the discrepancy in the effectiveness of financial incentives may lie in their magnitude or relevance to the individuals involved. They may even detract from more sustainable intrinsic motivations, such as personal and social responsibility. This is in line with some of the behavioural studies suggesting that the effect of providing financial incentives is mixed [44].

Our findings also suggest that financial incentives alone may not only be ineffective but could potentially reduce long-term engagement in energy citizenship. This aligns with SDT, which posits that extrinsic motivations, reliant on external validation and rewards, are typically less effective in promoting long-term, autonomous behaviour [16]. When people are motivated primarily by financial rewards, they may become less inclined to engage in energy citizenship behaviours once those incentives are removed, compared to those driven by intrinsic motivations like environmental responsibility and community engagement. Thus, relying solely on extrinsic motivators could undermine sustained pro-environmental behaviour.

6. Conclusions

This study contributes to a deeper understanding of the motivational dynamics underlying energy citizenship, by expanding the analysis of energy citizenship beyond individual behaviour and exploring how social and political structures influence personal motivations and engagement. This perspective aligns with the evolving nature of citizenship in the energy sector, where individuals are increasingly positioned as co-creators and decision-makers within a decentralized and democratized energy system. Therefore, understanding energy citizenship requires an integration of psychological theories with insights from polit-

ical science and sociology to explore comprehensively how cultural, social, and institutional factors shape individual and collective motivations.

The study underscores the critical role of intrinsic motivations in fostering sustainable energy practices, while also acknowledging the limited influence of extrinsic motivations. The results demonstrate that individuals are more likely to maintain their involvement in energy citizenship if they perceive their efforts as contributing to broader environmental or social improvements, rather than simply achieving personal gain. The intersection of intrinsic and extrinsic motivations with ethical considerations is vital. Furthermore, these findings highlight that active energy citizenship is driven by inspiration from a trusted person and a desire to contribute to the common good. This underscores the social nature of humans as they engage in energy citizenship to foster connections and work for the common good.

The study also underscores the importance of intrinsic motivations in predicting more challenging pro-environmental behaviours. The results indicate that as the complexity of the behaviour increases, intrinsic motivations become more critical. This suggests that for more demanding tasks, such as investing in renewable energy technologies or participating in community energy projects, individuals are more likely to engage if they are intrinsically motivated by values such as environmental concern and social responsibility.

The study's findings have significant implications for policymakers and practitioners aiming to promote energy citizenship. Strategies that enhance intrinsic motivations, such as raising awareness about the environmental impact of energy choices and fostering a sense of community and shared responsibility, may be more effective than those relying solely on extrinsic incentives like financial rewards or regulatory pressures.

To effectively foster energy citizenship, policies should focus on the following:

- Education and Awareness: Programs that educate individuals about the environmental and social benefits of energy citizenship can help align personal values with pro-environmental actions.
- Community Engagement: Initiatives that strengthen community ties and highlight the collective benefits of sustainable energy practices are likely to enhance intrinsic motivations.
- Support for Autonomy: Providing individuals with more choices and control over their energy-related decisions can further support autonomous motivation and sustained engagement in energy citizenship behaviours.

Future research could explore how different motivational profiles interact with specific energy policies and initiatives, providing more targeted recommendations for enhancing public engagement in the energy transition. Understanding these interactions could help design more effective strategies for promoting energy citizenship, ultimately contributing to a more sustainable energy future.

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