



ANALYZING THE CAUSES BEHIND FAILED ENERGY COMMUNITY PROJECTS

Assessing the Sustainability Challenges
and Development Phases

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1. INTRODUCTION

1.1 BACKGROUND

The global energy landscape is undergoing a transformative shift towards sustainability. At the forefront of this transition, the European Union (EU) embarked on the Energy Union strategy in 2015, culminating in the finalization of the "Clean Energy for all Europeans Package" (CEP) in 2019. This comprehensive legislative framework, comprising eight key texts, delineates crucial actions to mitigate greenhouse gas emissions, enhance climate resilience, and facilitate a unified energy transition. In December 2018, the EU revamped the Renewable Energy Directive 2009/28/EC, known as RED I, with the introduction of Directive 2018/2001/EU, commonly referred to as RED II [1].

Aligned with the 2030 Energy and Climate Framework and the ambitious 2050 Long-Term Climate Neutrality Strategy, RED II sets new targets for renewable energy sources (RESs) and energy efficiency post-2020. Significantly, RED II introduces a groundbreaking perspective by recognizing energy communities (ECs), particularly citizen energy communities (CECs) and renewable energy communities (RECs), as pivotal contributors to the energy transition. The directive envisions that the inherent factors of ownership and proximity within the concept of community can foster greater acceptance of RES projects. RED II establishes a regulatory environment aimed at promoting ECs and encouraging collective self-consumption [2].

Numerous benefits associated with energy communities have been reported, contributing to their positive impact on society and the environment. These benefits include raising public awareness about renewable energies [3], fostering acceptance of the energy transition, advocating self-sufficiency, reducing dependence on national grids, and promoting sustainability.



Local Energy Communities: A Transition to a Sustainable Energy System, digital image, accessed 11 May 2007, <<http://www.ooh.gov.au/frith/theherald-01.html>>

Despite the promising aspects, the paper acknowledges challenges faced by energy communities, with a particular focus on failed projects and their sustainability aspects. Issues such as a lack of common definition [4], understanding, and regulatory frameworks pose hurdles to the successful establishment and operation of energy communities. The exploration of regulatory issues, high-level regulations, and their implications on energy trading activities aims to provide insights into the dynamics of energy community failure.

In addressing these aspects, the paper endeavors to contribute valuable perspectives on the sustainability of energy communities, offering a nuanced understanding of their potential and the factors influencing their success or failure. By examining both the benefits and challenges, this research seeks to shed light on the intricate interplay that shapes the destiny of energy communities in the contemporary energy landscape.



1.2 IDENTIFYING THE RESEARCH GAP

Despite the growing body of research on the challenges and dynamics of energy communities, a conspicuous gap exists in the literature—a lack of focused inquiry into the causal factors contributing to the failure of energy community projects. While existing studies shed light on obstacles and success stories, there remains a dearth of comprehensive investigations into the specific reasons behind project failures. This gap is critical, as understanding the intricacies of unsuccessful energy community initiatives is indispensable for formulating effective policies, mitigating risks, and enhancing future outcomes.

Failures in energy community projects may result from factors like regulatory complexities, financial constraints, inadequate community engagement, or unclear definitions. Analyzing these failures provides nuanced insights into socio-cultural, economic, and regulatory contexts influencing project outcomes.

Getting firsthand information from the stakeholders about failed projects and understanding if challenges differ by country/location is crucial for validating findings and tailoring solutions to specific contexts.

1.3 RESEARCH FRAMEWORK

1.3.1 Objectives

1. Unraveling Energy Community Failures:
 - Investigate and comprehend the intricate causes behind the failures of energy community projects.
 - Scrutinize regulatory, financial, and community engagement challenges leading to project setbacks.

2. LITERATURE REVIEW



2.1 Overview of Energy Community Projects

A energy community project, as defined in this context, refers to any initiative that fosters collective or public ownership of renewable energy by a community or group of citizens, including municipal and cooperative endeavors. These projects not only contribute to the energy transition but also alleviate energy poverty, raise awareness, and stimulate local economies.

Moreover, they engender a sense of communal purpose and cohesion, fostering trust and cooperation in society, especially in times of social division and uncertainty.

However, despite these benefits, community energy projects encounter formidable barriers. Grid access poses a significant challenge, with grid operators often impeding community-owned projects' connection to the energy grid. Financial constraints further hinder progress, as banks and loaning institutions exhibit reluctance or lack understanding of community energy models.

Moreover, the absence of a supportive legal framework and burdensome bureaucratic procedures stymie project development. For instance, in the Czech Republic, where legislative support for renewables waned, community energy projects face insurmountable administrative hurdles. In Ireland, grid connection speculation and lack of legislative backing thwart community initiatives. [3]

Meanwhile, the shift from feed-in tariffs to bidding systems exacerbates challenges, favoring large developers over community projects.

In addition, the discourse surrounding Energy Communities (ECs) reflects a growing interest driven by the current energy crisis, amplified by concerns over increased energy prices and the vulnerability of centralized energy systems. Citizens increasingly view ECs as vehicles for sustainable transitions, offering not only monetary savings but also social benefits and autonomy.

However, the implementation and understanding of ECs vary across countries, with discrepancies in legal definitions and terminology complicating cross-model comparisons. The Nordic context presents unique challenges and opportunities, with the region's low population density necessitating extensive collective grids for electricity transport. ECs have the potential to enhance security of supply and resilience in remote areas, as demonstrated by projects in Norwegian islands. Yet, challenges such as uneven distribution of maintenance costs for long-distance transport lines persist. Moreover, the Nordic countries' reliance on renewable energy sources (RES) influences the progression of EC deployment, with Denmark leading the way and Norway still in its infancy due in part to its non-EU status and high RES inclusion.



2.2 Barriers and Drivers for Energy Communities

The Energy Communities Repository (ECR) recently convened a workshop to explore barriers and drivers for the uptake of energy communities (ECs). The workshop, facilitated by the European Commission, brought together stakeholders, including ECs, regulators, system operators, market actors, and academics. The aim was to discuss findings from the ECR's ongoing report on obstacles and action drivers for ECs in the context of the Clean Energy Package. [5]

Energy Sharing Challenges: The draft report outlined barriers hindering energy sharing, including a lack of regulatory frameworks in many countries, unclear concepts, and administrative hurdles. Participants emphasized challenges related to data access, software development, and the absence of incentives for energy sharing. Concerns were raised about vulnerable households losing benefits by participating in ECs.

Energy Supply Obstacles: Barriers to ECs supplying energy were discussed, such as a lack of acknowledgment in regulatory frameworks, administrative obstacles in obtaining licenses, and challenges related to business models and government interventions during the energy crisis. The discussion highlighted the need for tailored regulatory frameworks, access to financing, and education to overcome these barriers.

The European Commission and the Portuguese government introduced legal frameworks for renewable energy communities in 2018 and 2019, respectively, with the aim of fostering community-led energy initiatives. However, progress has been slow, with only three operational projects in Portugal four years after the initial legislative push.

Humberto Queiroz, a researcher at Portugal's Nova School of Science and Technology, highlighted the significant regulatory hurdles faced by energy community projects, noting that formal operations typically require a license from the Directorate-General of Energy and Geology (DGEG), a process known to take over a year. Consequently, approximately 200 projects are currently stalled in the regulatory pipeline. [6]

Despite the potential economic benefits, including lower electricity bills and local job creation, challenges such as permit delays, costs, and community engagement remain significant barriers to their success. Queiroz's research emphasizes the importance of time-variable energy-sharing coefficients for optimizing the performance of renewable energy communities, showcasing their potential to alleviate energy poverty and promote community resilience.



In Spain, the government has yet to establish a legal framework to support and protect energy communities, despite calls for recognition dating back over a year. Abel Porras, a member of the Cooperativa Energética, lamented the stagnation of projects due to resistance from electricity companies, who exert pressure to impede shared self-consumption and the development of energy communities. While energy communities hold promise for facilitating shared self-consumption and promoting the use of alternative energy sources on a cyclical basis, initiatives in southern Europe, such as solar panel installations in Sardinia and proposed changes in Portugal's electricity system, have encountered delays and challenges, despite interest from local councils and citizens. [7]

Coopernico, a Portuguese energy cooperative led by Ana Rita Antunes, struggles for recognition as an energy community in Portugal due to delays in regulatory frameworks. Legal definitions, while existing, lack uniform application across Member States, hindering the formation and operation of these communities.

Josh Roberts from REScoop highlights the pivotal role of policies, such as feed-in tariffs, in supporting small renewable energy producers. However, policy changes in Portugal, driven by the preference for large utility companies, have impacted the financial position of Coopernico and similar energy communities. Financing becomes a central issue, influenced by national policies that vary in compensating or charging communities for the energy they produce. [8]

3. METHODOLOGY



3.1 RESEARCH DESIGN

This study adopts a mixed-methods research design, combining an extensive literature review with a quantitative survey approach. The rationale for this design lies in its capacity to draw upon existing knowledge while capturing current insights from key stakeholders involved in energy community projects.

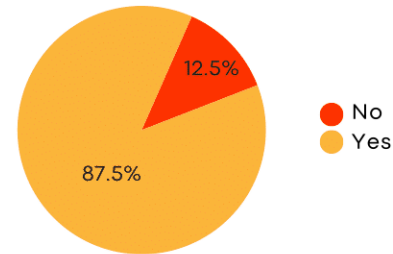


Figure 1. - Survey Q. Have you been directly involved in any energy community projects?

3.2 PARTICIPANT PROFILE

The survey engaged professionals with diverse roles in the energy community sector. Respondents included individuals from notable organizations, such as CER SOLE - Comunità Energetica Rinnovabile Solidale Libera Ecologica APS, Nadder Community Energy Ltd, ENERGÉTICA SOCIEDAD COOPERATIVA, Oresa EBK, MTVSZ - FoE Hungary, Sharenergy Cooperative Ltd, Cell Asbl, and Electra Energy Cooperative.

Roles of Participants:

- Vice President
- Company Secretary
- Equipo Técnico
- President
- Community Energy Coordinator
- Director
- Project Coordinator
- Energy Communities Project Manager

Countries of Origin:

- Italy
- United Kingdom
- Spain
- Basque Country
- Hungary
- Luxembourg
- Greece

Project Involvement:

- 87.5% of participants have been directly involved in energy community projects.

Key Observations:

- Roles varied from project initiation to implementation and advocacy.
- Diverse experiences across different European countries and regions.

3.3 DATA COLLECTION

The primary data collection method employed is a structured survey. A survey instrument, meticulously designed to align with the research objectives, is disseminated to a targeted sample of participants engaged in energy community projects across diverse regions within the European Union. The survey captures quantitative data on factors contributing to project failures, sustainability challenges, and perspectives on the developmental phases.

An exhaustive literature review serves as a foundational component of the data collection process. This involves a systematic exploration of scholarly articles, reports, and case studies relevant to energy community projects. The review not only provides a comprehensive understanding of the historical and theoretical underpinnings but also informs the survey design by identifying gaps and nuances in the existing body of knowledge.

3.4 DATA ANALYSIS

The approach to data analysis involves a meticulous examination of both quantitative and qualitative data. Quantitative survey responses are subjected to statistical analyses to identify trends, patterns, and correlations. Qualitative data, extracted from open-ended survey questions, undergoes thematic analysis to uncover nuanced narratives and contextual insights.

4. RESULTS

4.1 FINANCIAL LANDSCAPE

Financial constraints emerge as a significant challenge, as shown in Figure 2 with 62.5% of respondents citing this factor as a potential cause behind the failure of energy community projects. Coming in second, its significance is validated when we asked them to scale the level of importance and the majority of the respondents seemed to consider it as either important or very important, seen in Figure 3.

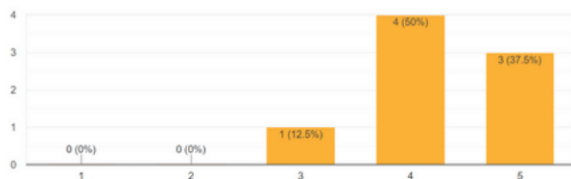


Figure 3 - Survey Q. How crucial do you believe sufficient funding is for the success of energy community projects?

4.2 REGULATORY IMPACT

Governmental policies and regulatory hurdles are identified by 25% and 75% of respondents, respectively, as potential primary causes of project failure. (Figure 2.) Thus, regulatory obstacles were acknowledged, with 50% of respondents noting their substantial negative effect on energy community project success. (Figure 4.)

This emphasizes the need for addressing regulatory complexities to ensure smoother project implementation.

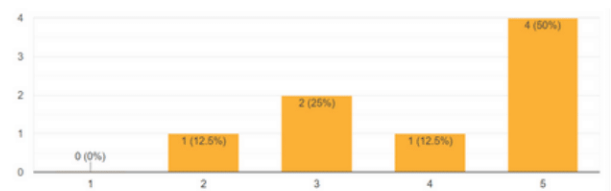


Figure 4 - Survey Q. To what extent do regulatory obstacles negatively affect energy community project success?

4.3 COMMUNITY ENGAGEMENT

Community engagement as a significant challenge, as shown in Figure 5 with 62.5% of respondents citing this factor to have a great impact on the success of an energy community project. Half of the respondents also chose it as a potential primary cause behind the failure of the energy community. (Figure 2)

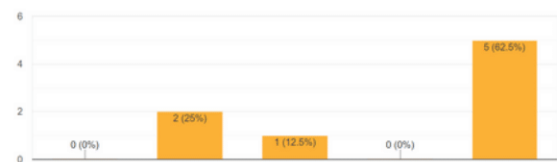


Figure 5 - Survey Q. How much do you believe challenges related to community engagement impact energy community project success?

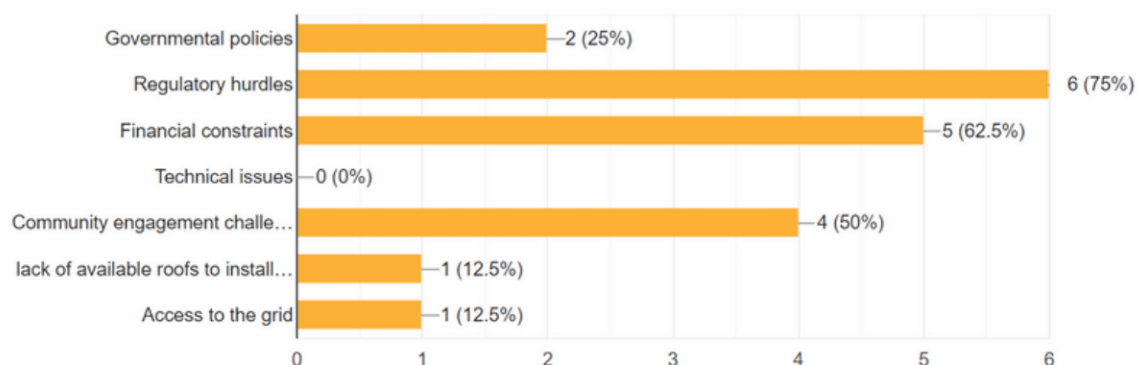


Figure 2 - Survey Q. In your experience, what factors do you consider as potential primary causes behind the failure of energy community projects?

4.4 STAKEHOLDER COLLABORATION

Strong collaboration among stakeholders is perceived to have a significant positive impact on energy community project success, with 50% of respondents rating it as a 4 and 37.5% rating it as a 5. This suggests a consensus among participants regarding the importance of stakeholder collaboration in ensuring the success of energy community projects.

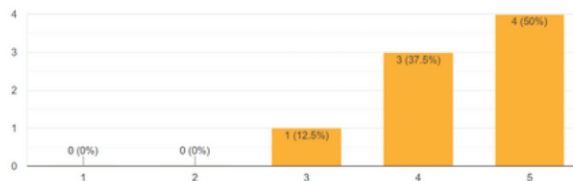


Figure 6 - Survey Q. How much do you believe strong collaboration among stakeholders positively impacts energy community project success?

4.5 TECHNOLOGICAL CHALLENGES

According to the survey, technology challenges pose a moderate risk to energy community project success. Four respondents (50%) rated the risk as a 2, indicating moderate concern, while three (37.5%) rated it slightly higher at a 3. Only one respondent (12.5%) rated it as a low risk (1), with no respondents considering it a significant (4) or severe (5) risk factor.

Overall, while recognized, technology challenges are not seen as the most critical barrier to success. (Figure 7)

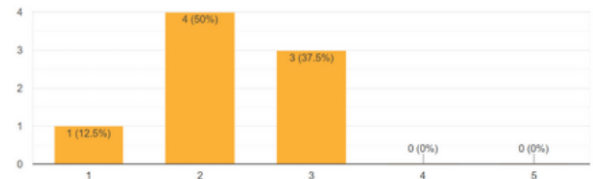


Figure 7 - Survey Q. How much do you think technology challenges pose a risk to energy community project success?

4.6 SUSTAINABILITY CHALLENGE

4.6.1 ENVIRONMENTAL IMPACT

Environmental impact emerges as a significant sustainability challenge for energy community projects, with 37.5% of respondents recognizing its importance, as shown in Figure 8. Additionally, the majority (62.5%) rated environmental impact as highly important for the success of energy community projects, underscoring the significance of environmental considerations in project planning and implementation. (Figure 9)

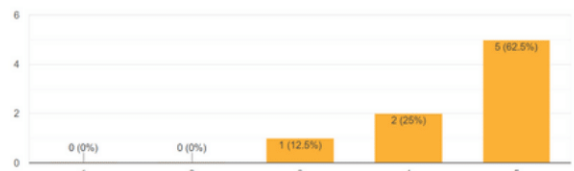


Figure 9. - Survey Q. How important do you think environmental impact is for the success of an energy community project?

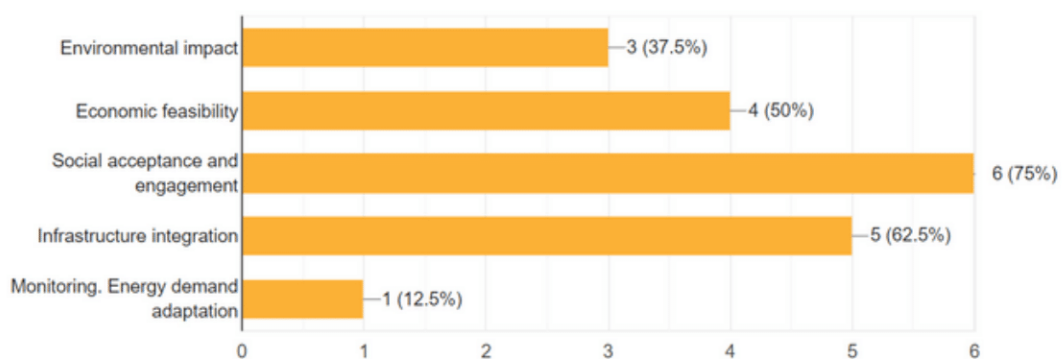


Figure 8. - Survey Q. How do you perceive the sustainability challenges associated with energy community projects?

4.6.2 SOCIAL IMPLICATIONS

Community engagement is considered significant for the sustainability of energy community initiatives, with 87.5% of respondents rating it as crucial (Figure 10). This underscores the consensus on the significance of community involvement. Additionally, 75% of respondents view social acceptance and engagement as crucial sustainability challenges for these projects. This emphasizes the importance of community involvement and acceptance for project success, as shown in Figure 8.

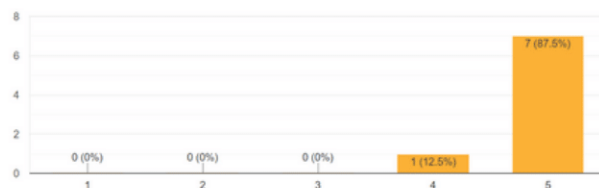


Figure 10. - Survey Q. How crucial is community engagement in the sustainability of energy community initiatives?

4.6.3 ECONOMIC VIABILITY

Ensuring economic feasibility in energy community projects is perceived as moderately challenging, with 50% of respondents rating it as a significant challenge (value 4) and 25% rating it as somewhat challenging (value 3). This suggests that there is a consensus among participants regarding the considerable difficulty associated with achieving economic viability in such projects. (Figure 11)

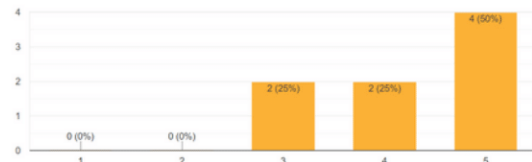


Figure 11. - Survey Q. From your perspective, how challenging is it to ensure economic feasibility in energy community projects?

4.7 DEVELOPMENT PHASES

Most respondents, accounting for 87.5%, are familiar with the different phases of an energy community projects.

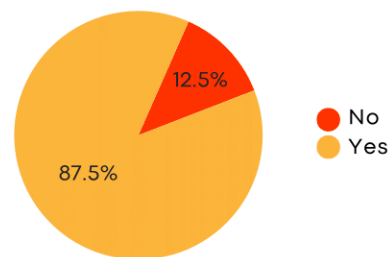


Figure 12. - Survey Q. Are you familiar with the different phases of an energy community project?

The critical phases involved in the development of an energy community project include planning and feasibility, implementation and construction, operational management, and monitoring and evaluation, each highlighted by 62.5% of participants. Additionally, social and participation mechanism design, community development, creation of team, and fundraising were mentioned by 12.5% of respondents each. (Figure 13)

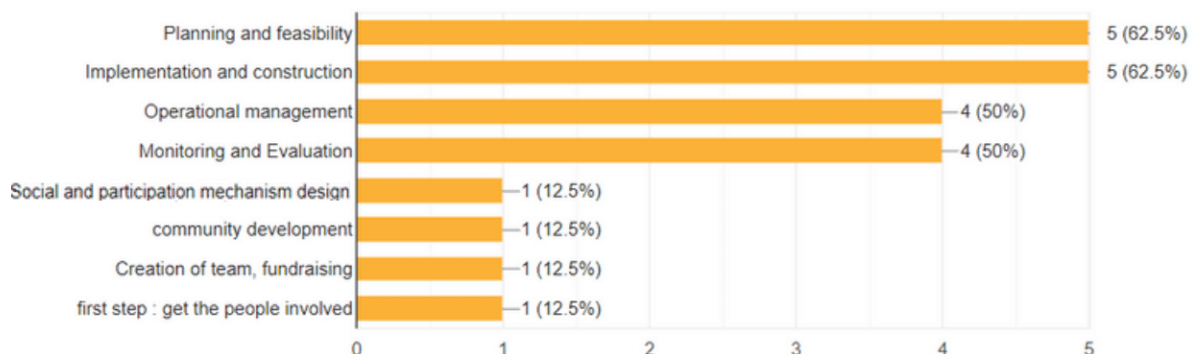


Figure 13. - Survey Q. Describe the critical phases involved in the development of an energy community project from your experience.

Based on the responses, planning and feasibility emerged as the phase where projects most commonly encounter challenges leading to failure, with 50% of respondents identifying it as such. Implementation and construction follow, with 37.5% of participants highlighting challenges at this phase. Meanwhile, monitoring and evaluation were cited by 12.5% of respondents as a common phase where projects face challenges leading to failure. (Figure 14)

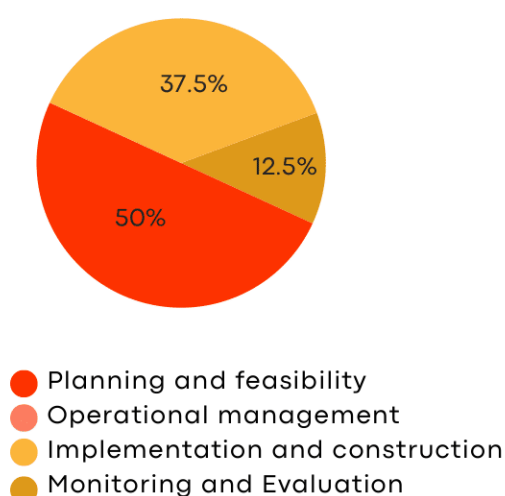


Figure 14. - Survey Q. At which phase do you believe projects most commonly encounter challenges leading to failure?

When asked whether the respondents have been involved in or are aware of an energy community project that failed, the results showed that a little over half of the respondents have encountered. (Figure 15)

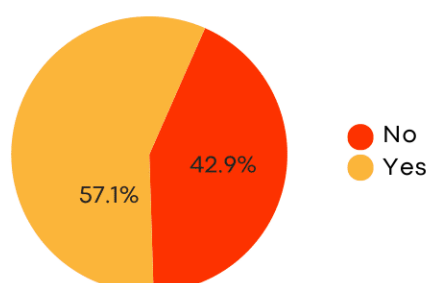


Figure 15. - Survey Q. Have you been involved in or are you aware of any energy community project that failed?

4.8 OPEN-ENDED INSIGHTS

CER SOLE, ITALY

Insights from respondents shed light on various factors contributing to the failure of energy community projects. The respondent, Vice President at CER SOLE - Comunità Energetica Rinnovabile Solidale Libera Ecologica APS in Italy, has provided insightful perspectives on energy community projects. They co-founded CER SOLE, which installed a 19.6 KWP FV plant to provide energy to a pizzeria and 10 families. They shared, "Because of regulatory hurdles and small margins on production, it is very hard to find a roof on which to install production." This quote encapsulates one of the significant challenges faced during the development of energy community projects.

NADDER COMMUNITY ENERGY, UK

The respondent, serving as the Company Secretary at Nadder Community Energy Ltd in the United Kingdom, has been actively involved in various energy community initiatives, including the administration of solar PV sites, share offers, feasibility studies, a pilot electric car club, and an energy advice service. They shared an example of project failure attributed to lack of community engagement, which resulted in a site owner withdrawing support for a ground-mounted solar array project despite extensive years of planning and feasibility efforts.

ENERGÉTICA SOCIEDAD COOPERATIVA, SPAIN

In the survey responses from ENERGÉTICA SOCIEDAD COOPERATIVA's technical team member, direct involvement in energy community projects primarily focused on promotion and expert advice. While specific failed project details were not provided, obstacles imposed by electric utilities and community agreement difficulties were cited as contributing factors.

OREXA EBK, BASQUE COUNTRY

The president of Oresa EBK, a company based in the Basque Country, has been directly involved in creating an energy community and currently serves as its president. They confirmed awareness of failed energy community projects and suggested community engagement as a preventative solution, stating "The most delicate point has been the participation of all the households in the municipality"

MTVSZ - FOE, HUNGARY

The community energy coordinator from MTVSZ - FoE Hungary has been directly involved in implementing the pilot project KESZ - CESCO. They identified several potential primary causes of energy community project failure. Specifically, they highlighted the lack of community development as a significant challenge, emphasizing the need for patience and trust-building among project officers and community members. They also emphasized the importance of a clear regulatory framework and fair pricing from energy suppliers for project sustainability. In terms of project development phases, they stressed the critical importance of community development alongside planning and feasibility. They cited examples of failed projects due to regulatory and technical issues, such as oversized PV systems and challenges with energy sharing.

SHAREENERGY CO-OPERATIVE, UK

The Director from Shareenergy Co-operative Ltd, with extensive involvement in energy community projects, identified governmental policies and regulatory hurdles as significant factors contributing to project failure. They cited unsupportive UK government policies towards renewables, particularly onshore wind, and highlighted the large regulatory hurdles across various domains such as the grid and planning system. Despite acknowledging the importance of collaboration among stakeholders, they emphasized that most project failures stemmed from external factors rather than internal weaknesses.

They stressed the crucial role of sufficient funding, realistic financial planning, and a resilient team for project success. In terms of sustainability challenges, they emphasized the importance of economic feasibility and community engagement. They also provided an example of a failed project, New Leaf Solar, which was to put solar on a landfill site in Herefordshire, citing excessive complications in the planning system and the influence of a small number of objectors as contributing factors.

CELL ASBL, LUXEMBOURG

The Project Coordinator from Cell Asbl in Luxembourg, with direct involvement in energy community projects, highlighted various factors contributing to project failure, including challenges related to governmental policies, regulatory hurdles, financial constraints, and technical issues. They specifically mentioned the reluctance of people to invest due to rising interest rates, potentially low guaranteed purchase tariffs, and the need for voluntary commitment. They emphasized the importance of strong collaboration among stakeholders, sufficient funding, and community engagement for project success.



They suggested measures such as providing good incentives, implementing prosumer policies, mutualizing services among energy communities, and increasing public awareness to ensure the long-term sustainability of energy community projects. Regarding project development phases, they underscored the critical importance of the initial step of getting people involved. They believed that challenges leading to failure often occur during the planning and feasibility phase. Additionally, they were aware of failed energy community projects but did not provide specific examples. Overall, they emphasized the importance of stakeholder collaboration, funding, community engagement, and addressing sustainability challenges for the success of energy community projects.

ELECTRA ENERGY COOPERATIVE, GREECE

The Energy Communities Project Manager from Electra Energy Cooperative in Greece provided insightful responses regarding the challenges and experiences faced in energy community projects. They highlighted several potential causes of project failure, including governmental policies, regulatory hurdles, financial constraints, technical issues, and challenges related to community engagement, particularly citing access to the grid as a significant obstacle.

Their experience with regulatory changes, such as a new law in March 2023, illustrates the instability that energy communities often face due to evolving regulatory frameworks, which can hinder their ability to operate effectively.

To ensure the long-term sustainability of energy community projects, they recommended starting with a comprehensive business plan and project assessment, regular member meetings to build interpersonal connections, and organizing workshops to maintain engagement during bureaucratic processes.

Finally, they shared insights from a failed project. They shared, "Our first project flopped because we didn't get a permit to move forward with the construction of the solar park (we intended for a 80kW one). The reason was the insufficiency of the local energy grid. We immediately started looking for alternative locations and planned a new project. "

These insights underscore the complexity of energy community projects and the necessity for comprehensive solutions addressing regulatory, financial, technical, and community-related challenges for their success.

5. DISCUSSION



5.1 Interpretation of Survey Results

The survey results offer valuable insights into the dynamics and challenges associated with energy community projects, as provided by respondents representing diverse roles and organizations across several countries. A significant majority of participants (87.5%) have direct involvement in energy community initiatives, indicating a widespread engagement within the surveyed group. This high level of participation underscores the importance placed on community-driven energy projects as a means to promote sustainability and local empowerment.

One of the standout findings from the survey is the identification of regulatory hurdles and governmental policies as primary causes of project failure. Across various regions, respondents highlighted the impact of changing regulations and bureaucratic complexities on the feasibility and execution of energy community initiatives. Additionally, financial constraints and challenges related to community engagement were recognized as significant barriers, further emphasizing the multifaceted nature of obstacles faced by project stakeholders.

Despite these challenges, there is a consensus among respondents regarding the critical importance of strong collaboration among stakeholders for project success. This acknowledgment underscores the interconnectedness of various actors involved in energy community projects, including local communities, regulatory bodies, businesses, and advocacy groups. Effective collaboration fosters shared goals, facilitates resource mobilization, and enhances project resilience in the face of external challenges.

The survey also sheds light on the nuanced sustainability challenges associated with energy community projects, ranging from environmental impact and economic feasibility to social acceptance and infrastructure integration. Respondents highlighted the need for comprehensive strategies that address these challenges holistically, emphasizing the importance of community involvement, financial planning, regulatory clarity, and technological innovation.

In terms of project development phases, planning and feasibility emerged as critical stages where challenges often arise, potentially leading to project failure. This underscores the importance of thorough planning, stakeholder consultation, and risk assessment early in the project lifecycle to mitigate potential setbacks.

Despite the obstacles encountered, respondents shared valuable insights into measures and strategies that contribute to the long-term sustainability of energy community projects. These include community involvement, financial modeling, regulatory advocacy, and capacity building. By investing time and resources in these areas, energy community initiatives can enhance their resilience, effectiveness, and positive impact on local communities and the environment.

5.2 Comparison with Literature

The findings from the survey align with several key themes identified in the literature regarding energy community projects. The survey respondents, representing various roles and organizations involved in energy communities across different countries, provided valuable insights into the challenges and opportunities faced by these projects.

Regulatory Hurdles:

Both the literature and survey responses emphasize the significant impact of regulatory obstacles on energy community project success. Survey respondents highlighted regulatory hurdles as one of the primary causes of project failure, with concerns about unclear concepts, administrative hurdles, and the lack of supportive legal frameworks. This aligns with the literature's depiction of regulatory challenges hindering project development in various regions, such as the Czech Republic, Ireland, and Portugal.

Financial Constraints:

Financial constraints emerged as another prominent barrier identified in both the literature and survey responses. Survey participants underscored the crucial role of sufficient funding for the success of energy community projects, echoing concerns about the reluctance of financial institutions and the lack of understanding of community energy models. This resonates with the literature's portrayal of financial challenges impacting project viability, particularly in regions where policy changes favor large utility companies over community initiatives.

Community Engagement:

Community engagement was recognized as a critical factor influencing the success of energy community projects in both the literature and survey results. Survey respondents emphasized the importance of building trust and cooperation within communities, highlighting the challenges of engaging residents and overcoming skepticism about renewable energy projects. This parallels the literature's emphasis on the significance of community involvement and cohesion in fostering the success and sustainability of energy communities.

Grid Access and Technical Challenges:

Grid access and technical issues were identified as significant challenges by both the literature and survey respondents. The survey highlighted concerns about access to the grid and the impact of technical challenges on project success, reflecting the literature's depiction of grid operators impeding community-owned projects' connection to the energy grid and the complexities of navigating technical requirements.

Sustainability and Environmental Impact:

Both the literature and survey responses underscored the importance of sustainability and environmental impact in energy community projects. Survey participants recognized environmental impact as a crucial factor for project success and highlighted challenges related to economic feasibility and social acceptance. This aligns with the literature's portrayal of energy communities as vehicles for sustainable transitions, offering not only monetary savings but also social and environmental benefits.

6. CONCLUSION

6.1 Summary of Findings

The survey findings align closely with the literature review, collectively highlighting the multifaceted challenges and opportunities inherent in energy community projects. Regulatory hurdles, including unclear legal frameworks and administrative complexities, emerged as significant barriers, echoing concerns raised in the literature.

Financial constraints, coupled with the reluctance of financial institutions to support community energy models, were identified as major obstacles to project viability and scalability. Community engagement was underscored as pivotal for project success, emphasizing the importance of building trust and fostering cooperation within communities. Grid access and technical challenges were also prominent concerns, with grid operators' reluctance to connect community-owned projects and technical complexities posing formidable barriers.

Moreover, sustainability and environmental impact were recognized as key considerations, emphasizing the need to address economic feasibility, social acceptance, and infrastructure integration for the long-term success of energy community initiatives.

In summary, while energy community projects offer promising pathways to sustainable transitions, addressing regulatory, financial, technical, and social challenges is imperative to realize their full potential and contribute to a more resilient and equitable energy future.

6.2 Recommendations for Future Projects

The survey responses and literature review highlight several implications for future energy community projects. Firstly, the significant regulatory hurdles identified in the survey align with the challenges outlined in the literature, particularly regarding grid access and legal frameworks. Addressing these hurdles requires policymakers to streamline administrative processes and provide clearer regulations, as noted by one respondent who mentioned, "The regulatory framework constantly changes, creating an unstable environment for energy communities to operate."

Secondly, the importance of financial support, as indicated by respondents' concerns about funding constraints, underscores the need for tailored financing mechanisms and incentives for community investment. As one respondent emphasized, "good incentives, prosumer policies, mutualise between energy community some paid services, more sensibilisation, more public awareness" are crucial for success. Collaborative efforts between governments, financial institutions, and community stakeholders are essential to overcome these challenges.

Thirdly, community engagement emerges as a critical factor for success, echoing the literature's emphasis on fostering trust and participation among community members. Strategies such as regular meetings and educational workshops, as recommended by another respondent, can enhance community involvement and project ownership.



Additionally, addressing technical challenges, including grid access and infrastructure integration, requires collaboration between energy providers and community stakeholders, as highlighted by respondents' experiences with grid access and technology risks. Lastly, ensuring long-term sustainability requires comprehensive planning and integration of environmental, economic, and social considerations, as emphasized by respondents' suggestions for business planning and community development initiatives.

By addressing these implications and building on the insights provided by respondents, future energy community projects can navigate challenges more effectively and realize their potential for promoting sustainable energy transitions.

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I also want to acknowledge the existing body of literature on energy communities. This research aims to contribute to the understanding of these initiatives and to address existing research gaps.

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My research concludes that energy community projects face a complex set of challenges. Addressing regulatory, financial, technical, and social issues is crucial for these projects to be successful. I found that the critical phases in developing an energy community project include planning and feasibility, implementation and construction, operational management, and monitoring and evaluation, with projects often encountering issues during the planning and feasibility stages.

This work highlights the need for comprehensive strategies that consider community engagement, financial planning, regulatory clarity, and technological innovation. My findings are consistent with the existing literature, which emphasizes similar challenges and drivers for energy communities.

This paper is aimed at contributing to a deeper understanding of energy communities by identifying the factors that lead to project failure and providing practical recommendations for future projects.

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