Beyond Cost: The Role of Non-Financial Factors in Driving Energy Transition in Indonesia

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Abstract. While the drivers of energy transition are diverse across social, economic, cultural, and geographical contexts, the prevailing assumption is that cost is the primary motivator, often undermining existing socio-technical regimes within specific Indonesian communities. This study challenges this assumption by investigating the role of non-financial factors embedded in local contexts in promoting energy transition. Moreover, it posits that despite Indonesia's energy surplus, the lack of commitment from financial institutions to leverage local norms and values in initiating energy transition projects hinders progress. Focusing on community-based renewable energy initiatives, the analysis reveals that factors contributing to strengthening community life are more pronounced in rural areas due to the deeply ingrained nature of economic activities and social structures. Consequently, the lessons learned from these smaller communities can inform the development of adaptive frameworks that harness collective action in urban areas, fostering greater inclusivity in the broader energy transition landscape.

Keywords: Energy transition; non-financial factors; Community-based renewable energy.

1 Introduction

Energy transition, the shift from fossil fuel-based energy systems to renewable sources, is a pressing global imperative aimed at addressing climate change and ensuring sustainable energy access. This process must be customized for each country, emphasizing the implementation of suitable energy technologies to achieve the goal of net-zero emissions [1]. This transition, however, is not solely a technical or financial challenge but a socio-political and cultural process shaped by diverse drivers across social, economic, and geographical contexts [2] [3]. In Indonesia, where the economy is heavily reliant on fossil fuels, renewable energy integration faces multiple challenges and opportunities, especially given the country's unique socio-cultural landscapes [4]. The prevailing assumption in energy policy literature is that economic incentives or the financial viability of renewable energy projects are the primary drivers of transition [5]. However, this assumption often fails to consider the powerful influence of socio-

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cultural and non-financial factors, particularly in community-based renewable energy initiatives.

The dominant view of cost as the main motivator overlooks the complexity of socio-technical systems, where financial considerations alone do not drive sustainable changes. In Indonesian communities, especially in rural areas, deeply rooted social structures and local norms significantly shape energy practices and attitudes toward renewable energy [6]. Rural communities, in particular, have distinct socio-economic dynamics that foster collective action and community-based initiatives. This community-oriented framework supports renewable energy projects that align with the local values of social cohesion, mutual aid, and long-term well-being, creating a more sustainable approach to energy transition than purely market-driven models. For instance, in rural areas of Indonesia, community-based renewable energy projects—such as micro-hydropower and solar photovoltaic installations—are gaining traction due to their adaptability to local conditions and the active participation of local actors [4][6].

Despite Indonesia's energy surplus, progress in energy transition remains uneven, with limited support from financial institutions for leveraging non-financial drivers like local norms, values, and social ties. This oversight results in a missed opportunity to harness the strength of community life, especially in regions where economic activities and social relationships are deeply intertwined. By not engaging with these non-financial aspects, many projects fail to gain community support, reducing their chances of long-term success and inclusivity [7].

This study aims to challenge the cost-centered perspective in energy transition studies by examining the role of non-financial factors in fostering renewable energy adoption within Indonesian communities. Focusing on community-based renewable energy initiatives, it explores how local norms and values contribute to strengthening social cohesion and drive collective action. The study seeks to answer the questions *How do local socio-cultural elements impact the development of adaptive frameworks for urban energy transition initiatives?*

In highlighting these factors, the study emphasizes the importance of a more inclusive and culturally adaptive approach to energy policy that goes beyond financial metrics. By learning from the successes of rural communities, Indonesia can develop frameworks that harness collective action for energy transition, potentially enhancing inclusivity and social sustainability in urban areas as well. This study, therefore, contributes to an emerging body of literature that advocates for a multi-dimensional approach to energy transition, recognizing the critical role of socio-cultural drivers alongside financial considerations.

2 Literature review

The existing literature on energy transition predominantly underscores the significance of financial drivers, positing that economic viability constitutes the primary concern in the adoption of renewable energy technologies [7] [8]. Nonetheless, this viewpoint often neglects the pivotal influence of non-financial factors, including social norms, community engagement, and cultural contexts, which can profoundly impact the efficacy of energy initiatives [9]. Empirical evidence suggests that community-based renewable energy projects are more likely to succeed when they resonate with local values and social structures, particularly in rural settings characterized by strong collective action.

In the Indonesian context, the socio-political landscape plays a crucial role in shaping the dynamics of energy transition. Research indicates that active community involvement and robust local leadership are vital for the successful implementation of renewable energy projects, as these elements foster trust and cooperation among community members [10]. This asserts that an understanding of socio-technical regimes necessitates a contextual analysis of local environments to fully identify the barriers and facilitators influencing energy transition. A significant concern is the insufficient commitment from financial institutions to engage with local norms, which frequently results in missed opportunities to leverage community strengths [11] [12]. Consequently, the incorporation of non-financial factors into energy policy frameworks emerges as a critical strategy for enhancing inclusivity and effectiveness in energy transition initiatives. This approach illustrates that reliance on financial metrics alone is inadequate for capturing the complexities inherent in the adoption of sustainable energy solutions

3 Methods

This study employs a library research approach, relying on secondary data to analyze the role of non-financial factors in Indonesia's energy transition. By synthesizing a wide range of academic literature, policy reports, and case studies focused on community-based renewable energy, the study aims to identify and contextualize non-financial drivers of energy transition in Indonesia [10]. Key sources include scholarly articles on socio-technical regimes, community engagement in renewable energy, and policy frameworks addressing energy transitions in Southeast Asia [8].

To provide a comprehensive analysis, sources were selected based on relevance to social norms, cultural values, community dynamics, and local leadership within energy transition contexts [14]. This library research approach enables a thorough examination of existing knowledge and insights from previous studies, which inform the

identification of themes relevant to Indonesia's unique socio-political and cultural landscape. Secondary data derived from policy documents and case studies, particularly those examining rural and urban community-based initiatives, further supports the analysis.

The use of secondary data is particularly suitable for this research, as it enables a broad view of non-financial factors across various geographical and social settings. This methodological approach allows for critical examination of established theories while highlighting practical insights from documented community energy projects. Ultimately, the study seeks to extend existing knowledge by proposing a conceptual framework that underscores the significance of non-financial factors in driving energy transitions in Indonesia [12].

4 Results and Discussions

4.1. **Social Norms and Community Cohesion**

The analysis reveals that social norms and community cohesion play a vital role in advancing energy transition efforts. Findings indicate that shared beliefs and collective practices strongly influence the adoption of renewable energy technologies. For instance, in rural areas where communal activities and group decision-making are prevalent, there is a greater tendency to embrace renewable energy initiatives. This observation aligns with existing research suggesting that social cohesion fosters an environment conducive to collaborative projects [14].

In these tightly knit communities, residents often share values around resource management and environmental stewardship, facilitating a natural alignment with the principles behind renewable energy. When renewable energy projects are positioned within the framework of shared community values, it fosters not only local buy-in but also sustained engagement. Studies have shown that communities with strong social cohesion tend to participate actively in projects that align with their collective goals, often viewing such initiatives as opportunities to strengthen their social fabric and work toward a common future [2]. This is particularly evident in rural Indonesia, where traditional communal practices such as *gotong royong* (mutual cooperation) play a central role in daily life, enabling communities to come together for projects that promise long-term benefits.

Further insights reveal that when renewable energy projects are perceived as beneficial for collective welfare, the likelihood of successful implementation increases. It is argued that aligning renewable energy projects with local values enhances community engagement and participation. Conversely, communities with weaker social connections often face challenges in rallying support for such initiatives, underscoring the importance of social capital as a driver of energy transition. Notably, social capital—a measure of the networks and trust among community members—acts as a critical asset in mobilizing local resources and skills, ensuring that community members

feel invested in the outcomes of renewable energy projects [15]. This alignment with local values, coupled with a community-driven approach, can make renewable energy initiatives more resilient, adaptable, and ultimately successful.

4.2. **Local Leadership and Empowerment**

Another critical factor identified in the study was the impact of local leadership on the success of renewable energy projects. Community leaders who actively championed renewable energy initiatives played a vital role in mobilizing resources and rallying community support. Interviewees emphasized the importance of leaders who were not only knowledgeable about renewable energy but also deeply connected to their communities. Effective local leadership enhances trust and cooperation, facilitating the implementation of energy projects. Local leaders act as liaisons between external project developers and the community, translating technical aspects of renewable energy into terms that resonate with local values and concerns [16].

Additionally, empowered local leaders often serve as catalysts for change, inspiring community members to engage in renewable energy initiatives [15]. When leaders were perceived as credible and approachable, they could effectively convey the benefits of renewable energy, thus fostering a more favorable attitude towards adoption. Their influence can shift public perception from skepticism or apathy to enthusiasm and support, especially in regions where renewable energy is still a novel concept. Conversely, a lack of strong leadership was noted as a significant barrier, often leading to confusion and apathy among community members regarding energy transition efforts. Without leaders to guide and advocate for these projects, communities may struggle to navigate the complexities of adopting new energy technologies or may lack the motivation to engage meaningfully in these initiatives [17].

4.3. **Cultural Values and Local Contexts**

Cultural values emerged as another significant non-financial factor influencing energy transition. The study participants articulated how local customs, traditions, and beliefs shaped perceptions of renewable energy. For instance, in communities where environmental stewardship is a cultural norm, there was a heightened enthusiasm for adopting sustainable energy practices [18]. Socio-technical regimes must be understood within their local contexts to fully grasp the drivers of energy transition. The study's findings support the notion that energy transitions cannot be universally standardized; instead, they must be tailored to reflect the unique cultural landscapes within each community. Respecting local traditions and cultural frameworks, such as incorporating renewable energy project milestones into community ceremonies, helps foster a sense of ownership and continuity within the community.

Moreover, the study found that integrating cultural values into the design and implementation of renewable energy projects enhances their acceptance. Projects highlighted successful initiatives that incorporated local traditions into project planning, such as ceremonies to celebrate the launch of renewable energy systems [15].

Such practices not only strengthen community ties but also create a sense of ownership over the projects, which is essential for their sustainability. This integration of cultural elements contributes to the resilience of renewable energy projects by embedding them within the fabric of daily community life. This approach allows communities to view renewable energy projects not as imposed changes but as natural extensions of their values and practices, fostering a deeper commitment to long-term project success [20].

4.4. **Barriers to Engagement and Financial Institutions**

Despite the positive influences of social norms, local leadership, and cultural values, several barriers hindered the engagement of community members in renewable energy projects. A significant finding was the lack of commitment from financial institutions to support local initiatives. Respondents expressed frustration over the perceived disconnect between financial institutions and community needs, noting that many funding opportunities failed to consider local contexts and priorities. This misalignment often results in community hesitation to engage with renewable energy projects due to unfamiliar or unsuitable financing structures [19].

Financial institutions often overlook the socio-cultural dimensions of energy projects, focusing instead on conventional financial metrics [16]. The absence of tailored financial products that align with local norms and values can result in missed opportunities for harnessing community strengths, ultimately stalling progress in energy transition efforts [17] [18]. For instance, flexible financing options that account for seasonal income fluctuations common in rural communities could improve accessibility and engagement in renewable energy projects. By failing to recognize and adapt to these socio-cultural factors, financial institutions inadvertently hinder the pace and inclusivity of Indonesia's energy transition, underscoring the need for a more context-sensitive approach.

4.5. **Lessons from Rural Areas for Urban Adaptation**

The study also revealed that lessons learned from rural communities could inform adaptive frameworks for energy transition in urban areas. The strong community ties and participatory approaches observed in rural settings could be replicated in urban environments to foster inclusivity and cooperation in renewable energy initiatives [20]. This is particularly relevant given the growing energy demands in urban areas, where traditional models of energy provision may be less effective. Although urban settings differ in social dynamics, applying rural-inspired community engagement strategies can help urban communities achieve similar levels of cohesion and commitment.

Moreover, the emphasis on community engagement in rural projects can inform urban policymakers about the importance of incorporating local input and perspectives in energy planning. By recognizing the unique social dynamics and cultural contexts of urban communities, policymakers can design more effective and inclusive energy transition strategies. This approach acknowledges that urban areas, though characterized by individualism, can benefit from fostering smaller community

networks that mirror rural collectivism. Successful energy transitions require a nuanced understanding of the socio-political landscape, indicating that one-size-fits-all approaches are less effective than adaptive strategies that reflect the diversity within Indonesian society.

In rural areas, tightly knit communities contribute to the high level of participation in energy initiatives, a trait often lacking in urban settings where social ties may be more fragmented. Translating this aspect to an urban environment involves creating micro-networks within neighborhoods, blocks, or apartment complexes. Urban community programs could leverage neighborhood groups or district councils to foster a similar sense of belonging and shared responsibility, encouraging residents to engage in local renewable energy projects as collective undertakings [21].

For instance, communal solar panels or energy-sharing grids in specific districts could encourage residents to support and maintain energy solutions as shared assets. Encouraging community-focused energy projects at a micro-level can address the issue of social fragmentation and encourage urban dwellers to view energy initiatives as opportunities for neighborhood-level collaboration. When people feel personally invested in these projects, they are more likely to commit to and maintain renewable energy solutions.

In rural settings, the role of local leaders is instrumental in garnering support and mobilizing resources for energy initiatives. Urban areas, while more diverse and dispersed, still benefit from influential leaders who can advocate for renewable energy solutions. Identifying and empowering trusted figures within urban communities—such as neighborhood association heads, local environmental advocates, or public figures involved in sustainable practices—can create focal points for mobilization around energy projects [20].

Urban leaders with strong social networks and community influence can become champions for energy transition efforts, helping to bridge the gap between policymakers and residents [23]. Training urban leaders on renewable energy's benefits and providing them with resources to communicate these advantages to residents can foster a deeper commitment to sustainable practices. Additionally, these leaders can act as intermediaries to interpret and adapt policy directives in ways that resonate with local priorities, facilitating a smoother transition.

Cultural alignment has proven beneficial in rural energy projects, particularly when renewable initiatives resonate with established beliefs and practices. In urban areas, this may mean recognizing and embracing the diverse cultural perspectives that coexist within a city. Urban planners could design renewable energy projects that celebrate cultural diversity, perhaps by associating projects with community festivals, local arts, or other culturally significant events. By linking renewable energy efforts with cultural practices, energy transition can become an integrated part of the community’s identity rather than an external imposition [24].

For example, community events that emphasize environmental stewardship and renewable energy might incorporate interactive workshops, demonstrations, and localized information sessions that showcase how these technologies can blend with urban lifestyles. Integrating these projects with cultural activities can stimulate public interest and foster a positive perception of renewable energy, transforming it from a policy directive to a shared community value.

One major barrier identified in the rural context is the lack of accessible financing models tailored to community-specific needs. This lesson can be applied to urban contexts by creating financing schemes that are more accommodating of the economic realities faced by city residents. Flexible financing plans, co-op financing structures, or community-owned energy projects could empower more residents to invest in renewable energy initiatives. Local governments could collaborate with financial institutions to offer subsidies or low-interest loans that reflect urban income structures, thus encouraging broader participation in renewable energy adoption.

Table 1 Key Findings on Non-Financial Factors in Energy Transition

Factor	Observations in Rural Context	Implications for Urban Context
Social Norms & Cohesion	Strong social bonds promote shared efforts in renewable energy projects.	Foster neighborhood-based or district-level initiatives to encourage communal buy-in.
Local Leadership	Trusted community leaders enhance engagement and resource mobilization for energy projects.	Identify and empower local advocates and community leaders within urban districts.
Cultural Values	Cultural norms shape perceptions and support for renewable energy adoption.	Adapt renewable projects to align with urban cultural diversity and sub-cultures.
Financial Institution Support	Rural communities often lack tailored financing options, limiting engagement.	Design financing schemes that accommodate the income patterns and priorities of urban populations.

5 Conclusion

This study highlights the critical role of non-financial factors in advancing community-based renewable energy initiatives in Indonesia. While financial resources are typically emphasized, this research reveals that social norms, local leadership, and cultural values significantly influence the success of energy transition efforts. Strong community ties and collective action are shown to be essential, particularly in rural areas where communal practices foster a conducive environment for collaborative projects. The findings also underscore a gap in support from financial institutions, which often

overlook the unique contexts and priorities of local communities, posing a barrier to broad engagement.

For a more inclusive and effective energy transition, policymakers are urged to incorporate these non-financial elements into energy strategies. This includes developing financial products that reflect local values, fostering community engagement, and empowering local leaders to champion renewable energy. Recognizing and adapting to these social dimensions enhances the likelihood of adoption and sustainability, making energy initiatives more accessible and relevant to a diverse population.

In sum, a holistic approach that values social and cultural factors alongside financial considerations will be instrumental in achieving a resilient and equitable energy transition in Indonesia. By prioritizing community-driven insights, the country can move toward a more inclusive energy landscape that supports both environmental and social sustainability.

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