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Integrating Stakeholder Participation in Energy-Efficient Building Refurbishment

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Abstract

Germany's transition towards sustainable energy production and supply has not only spurred the development of innovative power supply concepts and significant grid expansions but has also set ambitious targets for integrating low and zero carbon technologies in residential buildings. This research project specifically examines the challenges and opportunities associated with energy-efficient refurbishment in apartment buildings that have a large number of flat owners. A key challenge in this context is the decision-making process within owner communities, which must reach a majority consensus before undertaking any major refurbishment, whether it be standard or energy-efficient. Given the financial implications and the long-term impact on living conditions, achieving this consensus is often difficult. The diverse interests and financial capacities within these heterogeneous ownership structures present a significant barrier to the implementation of energy-efficient refurbishments. To address this, the research proposes a participation framework coupled with a robust communication strategy tailored to this specific stakeholder group. The framework draws on insights from various disciplines, including acceptance research, psychology, Design Thinking, and communication studies, to ensure that all owners are effectively integrated into the planning process. The goal is to develop energy-efficient solutions that can gain broad support among owners. Based on this interdisciplinary framework and previous studies, the research formulates ten essential communication recommendations designed to facilitate a successful planning process. In addition to traditional communication tools, the framework emphasizes the importance of implementing relevant online activities to engage stakeholders. The use of Design Thinking principles allows for the early identification of the owners' needs and requirements, ensuring that these are reflected throughout the planning and decision-making process through customized solutions. The paper proposed framework and exploring innovative participation opportunities that could increase refurbishment rates in large apartment buildings with multiple owners, thereby contributing to Germany's broader sustainability goals.

Keywords: Energy-Efficient Refurbishment, Multi-Owner Buildings, Sustainable Energy
JEL Codes: Q42, L74, R31

1. INTRODUCTION

After a period of widespread support, Germany's energy policy, particularly regarding renewable energy, is facing growing skepticism. Longitudinal studies conducted in various regions of Germany reveal increasing reservations toward renewable energy initiatives (Lenk et al., 2012; Rottmann and Kilian, 2015). One major issue has been the failure to implement energy-related refurbishment projects, often due to the lack of involvement of key decision-makers (Schweizer-Ries et al., 2010). These technically complex projects frequently stall because homeowners and other stakeholders are not adequately informed or included in the early stages of planning. To address this issue, it is crucial to explore ways to provide homeowners with neutral, comprehensive information about their options for energy-efficient redevelopment. By involving stakeholders from the outset, the chances of successful project implementation increase significantly. This paper proposes a procedure that aims to foster early, inclusive, and fair involvement of all relevant parties in the planning process. The goal is to improve the acceptance and success rate of energy-related refurbishment projects by ensuring that stakeholders are fully informed and actively engaged from the beginning.

In particular, identifying the various communicative factors that influence decisions regarding energy rehabilitation is crucial for fostering greater acceptance and participation in energy-efficient renovation projects. The human factor plays a central role in this process, as it encompasses psychological, social, and cultural elements that significantly shape individuals' attitudes and behaviors toward energy rehabilitation. These factors can include personal beliefs about sustainability, perceived financial benefits or burdens, and the broader social context in which decisions are made. For example, homeowners may be influenced by societal norms, peer behaviors, or their own environmental values when considering whether to invest in energy-efficient upgrades. Addressing the human factor requires a more nuanced approach, one that goes beyond technical and financial considerations to include a deep understanding of the stakeholders' emotional and social contexts. This is particularly important for Low and Zero Carbon (LZC) technologies, where long-term sustainability goals must align with individuals' immediate needs and concerns. To ensure that energy rehabilitation projects are successful, decision-makers must engage homeowners in a way that resonates with their personal motivations and circumstances. This engagement can help overcome common barriers such as perceived complexity, high upfront

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costs, or skepticism about long-term benefits.

Incorporating principles from Design Thinking can be a transformative approach in this context. Design Thinking emphasizes empathy and understanding the user's needs, making it a powerful tool for energy-related renovation projects. When these insights are applied, the solutions are developed with a focus on the real and specific needs of apartment owners, ensuring that they are not only technically sound but also aligned with the homeowners' expectations and lifestyles. For instance, instead of offering one-size-fits-all energy rehabilitation packages, Design Thinking advocates for personalized solutions that take into account the unique characteristics of each home and the priorities of its residents. This could involve providing customizable energy-saving technologies or developing phased renovation plans that allow homeowners to implement changes gradually, reducing financial and logistical pressure. Moreover, communicative strategies can be tailored to reflect this user-centered approach. Rather than focusing solely on technical jargon or financial incentives, the communication should emphasize the personal and community benefits of energy rehabilitation, such as increased comfort, improved health, or enhanced property value. By framing energy-efficient renovations in terms that directly relate to homeowners' lives, stakeholders can foster a greater sense of ownership and commitment to the project. Another critical aspect is the inclusion of all stakeholders early in the planning process. This means not only informing homeowners about the available options but actively involving them in decision-making. When homeowners feel that their voices are heard and their concerns are addressed, they are more likely to support and invest in energy rehabilitation initiatives. This collaborative approach also builds trust between the decision-makers and the residents, ensuring that the solutions proposed are both practical and well-received.

In sum, to effectively promote energy rehabilitation, it is essential to integrate communicative factors and the human dimension into the decision-making process. By applying insights from Design Thinking and focusing on the specific needs and motivations of homeowners, stakeholders can create solutions that are not only technically feasible but also emotionally and socially resonant. This approach will help overcome common obstacles and enhance the overall success of energy-efficient renovation projects, contributing to the broader goals of sustainability and energy conservation. The overriding goal in this process should be to empower homeowners and stakeholders to make well-informed decisions, weighing both the major advantages and disadvantages of the proposed energy rehabilitation options. To achieve this, the approach must be grounded in a comprehensive understanding of human behavior and communication. Therefore, in this paper, theories, methods, and instruments from the fields of psychology, sociology, and communication studies are utilized. These disciplines provide valuable insights into how individuals and groups make decisions, interact with information, and participate in collective actions.

From psychology, the focus is on understanding decision-making processes, behavioral motivations, and the cognitive biases that may influence how people perceive energy rehabilitation projects. This allows for the development of communication strategies that resonate with homeowners' personal concerns, such as comfort, cost savings, or environmental impact. Sociological theories, on the other hand, offer insight into the broader social dynamics at play, such as the influence of social norms, community values, and peer behaviors, which can be leveraged to encourage collective action and acceptance of energy-efficient initiatives. Communication studies contribute tools and methods for effectively delivering information and engaging stakeholders, ensuring that the message is clear, accessible, and persuasive. The participation instruments proposed in this paper are derived directly from these theoretical foundations, aiming to foster an inclusive and transparent decision-making process. For example, participatory planning methods, which involve stakeholders in the decision-making process from the outset, can help ensure that the proposed solutions align with the needs and expectations of the people most affected. This includes organizing workshops, forums, and consultations where homeowners can voice their concerns, ask questions, and contribute ideas, making them active participants rather than passive recipients of top-down decisions.

In recent years, online-supported participation has become increasingly important as a means of enhancing stakeholder engagement (Nanz and Fritsche, 2012). Digital tools such as interactive platforms, webinars, online forums, and surveys offer flexible and accessible ways for stakeholders to participate in the planning process, even if they cannot attend in-person meetings. These tools enable broader outreach, allowing for real-time feedback and continuous dialogue between decision-makers and stakeholders. Given the growing prevalence of digital communication, this paper will also investigate the prerequisites and potential applications of online-supported participation, considering factors such as digital literacy, accessibility, and the integration of these tools with traditional forms of engagement. By combining insights from psychology, sociology, and communication studies, and by embracing both traditional and digital participation instruments, the proposed approach aims to create a more informed, inclusive, and participatory process for energy rehabilitation projects. This holistic strategy not only facilitates better decision-making but also strengthens the sense of ownership and commitment among homeowners, ultimately contributing to the success of energy-efficient renovation initiatives.

2. METHODOLOGY

More than just an academic field, Design Thinking represents a relatively new approach to product innovation, emphasizing the importance of user-centered design from the earliest stages of product development. Traditionally, designers were brought in after an idea had already been developed to make it more attractive to consumers. However, this paradigm has shifted. As Brown (2008) explains, companies now involve designers from the start to create ideas that are more aligned with consumers' needs and desires. This shift moves design from merely an aesthetic role to one of strategic innovation. In this context, the user of a product, service, or application becomes the primary focus at an early

stage, with designers engaging directly with users to understand their behaviors, motivations, and emotions. Kelley (2002) highlights the importance of observing people in their natural environments, not just to capture their actions but also to gain deeper insights into what drives them. This human-centered approach includes personalized interactions with selected users to ensure that their unique preferences and challenges are fully understood (Kelley, 2002). This shift toward human-centered design has not been confined to product development alone. It has influenced various fields, including technology, sociology, and research on social acceptance. The emphasis on the "human factor" is now a widely recognized principle across many disciplines. As Adikari et al. (2016) note, "design driven by user needs" focuses on gaining a deep understanding of all stakeholders and their contexts of use. This approach involves users throughout the design process, including development and long-term monitoring, ensuring that the final product or service truly meets their needs. In the realm of energy rehabilitation and citizen participation, the importance of early stakeholder involvement is well-documented. The small but growing body of research on this topic consistently indicates that providing early and thorough information to all stakeholders is a key factor in the successful implementation of energy-saving measures (Arbter, 2012; Schäfer and Keppler, 2013; Hofmann, 2016). Given this, it seems promising to apply the principles and tools of Design Thinking to the participation process for energy conservation projects. In practical terms, adopting a Design Thinking approach for energy rehabilitation involves a precise analysis of the needs and perspectives of apartment owners and other stakeholders. By understanding their motivations and constraints, more suitable solutions for energy-related renovations can be developed. The Design Thinking process, particularly the phases of "Understand," "Observe," and "Define the point of view," are especially important when planning an energy refurbishment. These stages ensure that decision-makers not only comprehend the technical aspects but also empathize with the users, which leads to more effective, user-centered solutions.

The "Understand" phase involves gathering a broad range of insights about the stakeholders' needs, preferences, and expectations. This is followed by the "Observe" phase, where direct observations of users in their environments help identify pain points, behaviors, and desires. Finally, the "Define the point of view" phase synthesizes the insights gained into a clear, actionable problem statement that reflects the users' true needs. Applying these phases to energy rehabilitation ensures that solutions are not only technically feasible but also socially and emotionally resonant for those affected by the process. By adopting this user-centered approach, the energy rehabilitation process can become more inclusive, ensuring that all stakeholders, especially homeowners, feel heard and involved. This approach enhances the likelihood of success by aligning technical solutions with the actual needs of those who will benefit from the renovations, ultimately contributing to more sustainable and widely accepted energy-saving measures.

In Design Thinking, it is essential that the solutions developed closely align with the needs of the stakeholders involved. These solutions are refined and adapted through an iterative process, where feedback and continuous improvement are critical (Ambrose and Harris, 2013). In practice, this iterative process can be facilitated by various feedback instruments, such as questionnaires and qualitative interviews. These tools are valuable not only for identifying initial ideas but also for evaluating them at different stages, supporting more informed decision-making. By collecting feedback, designers can ensure that the proposed solutions evolve in response to real user input, making the outcome more relevant and effective. The success of this iterative process hinges on structuring the entire process—and each phase—from a participatory and communicative standpoint. Engaging stakeholders throughout the process ensures that their perspectives are heard and integrated at every stage. This participatory approach fosters a sense of ownership and commitment, which is particularly crucial in projects like energy rehabilitation, where long-term stakeholder buy-in is needed for success.

Another essential element of Design Thinking is the creation of collaborative "spaces," particularly when interdisciplinary teams work together on a project. These spaces serve as environments that encourage innovation, creativity, and the exchange of ideas. Kelley (2002) emphasizes the importance of creating such spaces, arguing that physical environments and a sense of community are key to fostering innovation. In the context of energy rehabilitation, these "spaces" could be both physical and metaphorical—places where stakeholders, such as homeowners, engineers, and designers, come together as equals to discuss ideas and solutions (Arbter, 2012). These collaborative spaces are not only important for fostering creativity but also play a crucial role in facilitating communication. Effective communication tools must be selected to suit the dynamics of these spaces and ensure that all stakeholders can contribute meaningfully. Whether through face-to-face meetings, online forums, or interactive workshops, the aim is to create environments where all participants can engage, share their perspectives, and collaborate on finding the best solutions.

Design Thinking emphasizes iterative development, stakeholder feedback, and the creation of collaborative spaces as key elements for generating solutions that meet the real needs of users. In the context of energy rehabilitation, applying these principles helps ensure that the solutions are not only technically viable but also socially and emotionally aligned with the needs of homeowners and other stakeholders. By organizing the process around participation, communication, and collaboration, Design Thinking provides a robust framework for driving innovation and achieving successful outcomes. A fundamental aspect of Design Thinking is the principle of making communication as tangible and perceptible as possible, allowing stakeholders to engage with information not just intellectually but also through visual and, where feasible, haptic (touch-based) experiences. The goal is to create communication tools that stakeholders can interact with physically, enhancing their understanding and engagement. This aligns with the idea of creating "compelling visualization tools" that can communicate strategic outcomes and value propositions effectively to all key stakeholders (Weiss, 2002). Making information visually appealing and physically accessible helps to address the diverse needs of stakeholders and ensures that complex ideas are presented in an easily digestible manner.

In the context of energy renovations, this approach can be particularly useful. For instance, model house visits or tours of

power plants can provide homeowners with a direct experience of energy-efficient technologies in action, making abstract concepts more concrete (Schäfer and Keppler, 2013). Such initiatives not only provide technical insights but also help stakeholders envision the practical application of energy renovations in their own homes, leading to higher engagement and acceptance. A similar approach has been successfully implemented in state energy-saving programs in the U.S., where didactic tools such as thermal images or samples of insulation materials were used to demonstrate the effectiveness of energy-efficient technologies. Coltrane et al. (1986) argue that new technologies are more likely to be adopted when individuals or groups have the opportunity to see the innovation in action and witness its results. This kind of tangible demonstration fosters trust in the proposed solutions and increases the likelihood of adoption. To further enhance the tangible experience, modern tools such as 3D models and virtual representations can be employed. These digital tools offer immersive ways for stakeholders to interact with renovation concepts and explore potential outcomes in a highly visual and interactive format. For example, 3D models can simulate how insulation or new energy systems would look and perform in a home, providing a realistic preview without the need for physical prototypes. Additionally, virtual reality (VR) could allow homeowners to tour energy-efficient homes or power plants remotely, giving them a firsthand experience of the benefits without the logistical challenges of arranging physical visits. In the field of energy renovations, show houses—demonstration homes retrofitted with energy-efficient technologies—are another effective tool for making the benefits of energy-efficient renovations tangible. These homes can showcase the use of different insulation materials, energy-saving appliances, and renewable energy technologies, offering a hands-on learning environment where stakeholders can see, touch, and even test out various solutions. These communication tools, whether physical or digital, represent significant challenges but also opportunities for a comprehensive communication strategy. By making the experience of energy-efficient renovations more interactive and accessible, these methods can bridge the gap between abstract energy-saving concepts and practical, real-world applications. This approach ultimately enhances the decision-making process by providing stakeholders with clear, engaging, and tangible representations of the benefits of energy rehabilitation.

3. DISCUSSION

When it comes to energy-efficient refurbishment, a well-structured communication model for participation is essential. This model outlines key requirements for successful communication, helping integrate them into a comprehensive and sustainable communication strategy. Such a strategy is critical for fostering the acceptance of decisions made during the refurbishment process. A crucial factor in this context is the interaction between stakeholders and experts, as well as the establishment of a neutral, credible authority. Credibility becomes a decisive element in this interaction, ensuring that the information shared is trusted and accepted by all involved parties. In communication studies, credibility plays a vital role in understanding complex interactions between the sender (transmitter), the receiver, and the message itself. It is particularly important in contexts where technical and specialized knowledge is required—such as energy-efficient refurbishments—where stakeholders may lack expertise. The construct of credibility is widely researched in fields such as journalism, media studies, and digital communication, especially given the rise of online information dissemination. The Credibility and Digital Media Project at the University of California, Santa Barbara, is one such example of how this concept is being explored in the digital age.

In the context of energy refurbishment, effective communication is fundamental to ensuring that stakeholders receive accurate, reliable, and trustworthy information to make informed decisions. When credibility is lacking, or when the necessary information fails to reach stakeholders in a clear and understandable manner, it can lead to hesitation or rejection of the proposed refurbishment. As Stern (1985) points out, "People often fail to notice, understand, or trust the information." This is especially true in technically complex fields like energy-efficient renovations, where the technical knowledge required can be overwhelming or difficult for homeowners and stakeholders to grasp. The credibility of information, therefore, directly influences attitudes and, ultimately, the acceptance of energy-efficient refurbishment proposals. When stakeholders perceive the source of information as credible—meaning the information is trustworthy, reliable, and delivered by a knowledgeable expert—they are more likely to support the proposed changes. This highlights the need for communicators in energy refurbishment projects to establish themselves as credible sources by ensuring transparency, accuracy, and neutrality in their messaging. In addition to clear communication, the involvement of a neutral instance, such as independent consultants or third-party organizations, can enhance credibility. These neutral entities act as unbiased facilitators, helping to ensure that the information presented is impartial and focused on the best interests of the stakeholders, rather than being influenced by commercial or political agendas. Their involvement can also help to bridge the gap between technical experts and non-expert homeowners, making complex information more accessible and trustworthy.

In sum, credibility is a cornerstone of effective communication in energy-efficient refurbishment projects. It ensures that stakeholders trust the information they receive, which in turn shapes their attitudes and increases the likelihood of accepting the final decision. To build credibility, communicators must provide clear, accurate, and transparent information, while also involving neutral, trusted entities in the process. This approach ensures that stakeholders feel informed and confident, leading to more successful and widely accepted energy refurbishment initiatives. The credibility of a message is closely tied to the credibility of its source. As Stern (1984) observes, "A given message, when attributed to a person of high credibility, produces greater attitude change in the target audience than the same message attributed to a person regarded as either inexpert or untrustworthy." This highlights that trust in the source plays a critical role in how effectively information is received and accepted. In the context of energy-efficient refurbishment, this means that

the trustworthiness of the communication process involves not only the experts providing technical information but also the broader social network of homeowners. Both of these elements can significantly influence decision-making. The **trustworthiness** of experts, however, is not uniform. Different stakeholders may hold diverse or even contradictory views about the expertise and reliability of professionals involved in energy refurbishment projects. Some homeowners may place high trust in technical experts and consultants, while others may be more skeptical, depending on past experiences or preconceived notions. This variability can be exacerbated by conflicting advice from various experts, which may further complicate the decision-making process for homeowners. Moreover, trust also extends beyond professional experts to include the social networks of the homeowners, such as friends, family, and neighbors. Here, too, credibility can differ widely. Homeowners may receive conflicting opinions from their peers, with some supporting energy renovations based on positive experiences, while others may be skeptical or resistant to change. These differing perspectives from within a social circle can greatly influence how homeowners perceive the credibility of information and the decisions they ultimately make.

An interesting aspect highlighted in previous studies in the U.S. is that energy supply companies were found to suffer from significant credibility issues. Households, particularly those with low incomes, were more likely to trust neighborhood initiatives and non-profit organizations rather than corporate entities (Coltrane et al., 1986). This suggests that the perceived motivations of the source—whether profit-driven or community-based—play a significant role in determining credibility. In contrast, households with higher incomes were more inclined to rely on their social networks when making decisions, preferring advice from friends and peers over formal institutions (Coltrane et al., 1986). This shows that credibility is not only context-dependent but also influenced by psychosocial and demographic factors.

These findings emphasize that the success of energy-efficient refurbishment initiatives depends on recognizing the diversity of credibility sources across different groups. To address these challenges, communicators must tailor their strategies to the specific demographic and psychosocial contexts of their target audiences. For instance, in low-income communities, non-profit organizations or local neighborhood groups may serve as more trusted intermediaries, while in wealthier areas, leveraging social networks could be more effective.

In sum, credibility is a complex construct that varies depending on the source of the message and the psychosocial characteristics of the audience. Trust in both experts and social networks influences how homeowners perceive the reliability of information, and this trust is shaped by demographic factors. Effective communication strategies for energy-efficient refurbishments should therefore be tailored to these varying perceptions of credibility, ensuring that the sources of information are seen as trustworthy and relevant to the target audience. By aligning the message with credible sources, whether they are technical experts, community leaders, or peers, the likelihood of acceptance and successful decision-making increases. In various energy-saving programs in the U.S., it has been demonstrated that personally addressing homeowners is a critical success factor in encouraging participation and promoting energy-efficient practices (Coltrane et al., 1986). This finding reinforces the importance of directly engaging all apartment owners and responding to their specific needs during the planning and implementation of an energetic refurbishment project. Tailoring communication to individuals not only ensures that homeowners feel involved, but it also increases the likelihood of project acceptance and commitment.

When planning a comprehensive energy refurbishment, the decision-making process typically involves multiple stages of communication with homeowners. This includes acquiring information through different channels, evaluating that information, and engaging in follow-up communication to clarify concerns or provide updates. Each of these communication phases plays a vital role in guiding homeowners through the complex process of deciding whether to invest in energy-efficient renovations. For homeowners' associations (HOAs), it is particularly important to have a neutral third party guiding the participation process. This neutral entity can help facilitate the various stages of communication, ensuring that all stakeholders' voices are heard and that the process remains fair and transparent. Ideally, this neutral instance would be involved throughout the stages of conceptualization, target setting, moderation, mediation, coordination, and evaluation. By doing so, they can ensure that the project progresses smoothly and that conflicts or misunderstandings are managed effectively. The professional design of the participation process requires an overall concept that encompasses all stages, from initial planning to execution and evaluation. Each communicative step within the process must be carefully defined, with clear objectives set for the different stages of homeowner engagement (Bischoff et al., 1996). This ensures that the communication strategy is aligned with the broader goals of the refurbishment project and that the information provided to homeowners is clear, consistent, and tailored to meet their needs.

The implementation of this communication strategy is not a standalone task; it is an integral part of comprehensive energy refurbishment management. Successfully executing the communication plan requires not only meeting pre-defined communication targets but also continuously evaluating the effectiveness of the strategy. This iterative process allows for adjustments based on homeowner feedback and evolving project dynamics, ensuring that the communication remains responsive and effective throughout the refurbishment. Although, personalizing communication to homeowners, particularly in the context of HOAs, is essential for the success of energy refurbishment projects. A neutral third party can play a key role in facilitating communication and managing the participation process. By developing a well-structured communication strategy that clearly defines objectives and involves continuous evaluation, energy refurbishment projects can achieve greater transparency, homeowner buy-in, and ultimately, successful implementation. Once an ideal communication process has been modeled and general communication guidelines established, attention must shift to the specific conditions that apply to large Homeowner Associations (HOAs). The participation instruments used for these settings are largely drawn from participation research and are specifically designed for dynamic groups. These tools are

intended to mitigate the common issue of social selection in participation meetings, where certain groups—those with greater articulation skills, familiarity with authority, and more free time—tend to be overrepresented. Bischoff et al. (1996) highlight this challenge: "Participation offers are socially selective. Groups capable of articulation, dealing with authorities, and, above all, having sufficient free time are always overrepresented. In large HOAs, preventing this imbalance is crucial to ensuring that all voices are heard, particularly when decisions affect a large number of owners. To avoid social selection, it is essential to carefully select participation instruments that engage a broad range of stakeholders. This may include employing various participation tools that can accommodate both large and small groups, ensuring inclusivity and equal representation. However, using these participation instruments often requires a significant organizational effort, which entails substantial commitments in terms of personnel, time, and financial resources. Preparing, coordinating, and following up on participation events can be resource-intensive. For example, a "consensus conference" may cost up to €50,000 (Bertelsmann Stiftung, 2017). As such, balancing effectiveness with cost-efficiency becomes a priority. To manage the resource demands of these processes, especially in large HOAs, leveraging innovative methods like E-participation can be crucial. Digital tools and online platforms can make participation more accessible and reduce costs while maintaining the integrity and inclusiveness of the process.

The participation instruments to be employed generally fall within the framework of deliberative democracy, which emphasizes structured dialogue and collaborative decision-making. Common examples include the 21st Century Town Meeting, working groups, consensus conferences, and the World Café method. Each of these instruments is designed to facilitate meaningful interaction and decision-making among large groups of stakeholders. Other tools, borrowed from disciplines outside of participation research—such as focus groups, scenario planning, and Planning for Real—have been adapted to serve the same purpose, helping to involve diverse participants in the decision-making process. The "original" forms of participation mentioned, such as consensus conferences and World Café, are recognized for their structured nature, leading participants toward a didactic aim through a gradual, phase-wise increase in involvement. These processes typically start with broader, more inclusive participation and move toward more specialized, focused discussions as the decision-making process advances. For large HOAs, it is critical to make a suitable selection of participation instruments, especially when dealing with projects that involve hundreds of participants across neighborhoods or districts.

At the beginning of the process, it is advisable to hold large-scale meetings where the full body of homeowners and other stakeholders are encouraged to participate. These meetings help to establish a foundation for the project, allowing all parties to engage with the broader context and objectives of the refurbishment. As discussions progress and more detailed issues emerge, smaller, more focused meetings with specific owner groups or expert panels can be organized. These smaller meetings allow for more in-depth discussion of technical or specific issues that might not be feasible in a larger setting. Finally, after these phases of smaller, focused discussions, a large event should be held to bring the community back together for a final vote on the project. This approach ensures that all voices are heard at critical stages of the decision-making process and that the final decision reflects a comprehensive understanding of the collective interests. Organizing participation in large HOAs requires the use of diverse, inclusive, and well-structured communication instruments to ensure all stakeholders are meaningfully involved. By strategically employing a combination of in-person meetings, small group discussions, and E-participation, and maintaining a phased approach to participation, the process can be made more effective and efficient. This leads to a greater likelihood of consensus, acceptance, and successful implementation of energy refurbishment projects.

4. CONCLUSION

The decision-making process preceding an energy renovation often fails to achieve the desired outcome. A key reason for this is the insufficient consideration of the needs and concerns of stakeholders, particularly apartment and homeowners, during the early stages and throughout the planning process. When stakeholders feel that their perspectives are not fully understood or integrated, they may resist the proposed renovations, leading to delays, disagreements, or even abandonment of the project. Homeowners, as the primary beneficiaries or bearers of the costs of such renovations, require clear communication and engagement to feel confident about the proposed changes. This means that their financial concerns, comfort expectations, and long-term benefits must be addressed from the outset. If these needs are overlooked or inadequately addressed, the process may lose the support of key stakeholders, which is critical for the success of energy-efficient renovations. Engaging stakeholders from the very beginning—through consultations, workshops, or participatory planning sessions—allows them to voice their concerns, ask questions, and contribute to shaping the project. This early and continuous involvement ensures that their needs are considered at every stage of planning, leading to greater transparency, trust, and ultimately, a more favorable outcome. Following the principles of Design Thinking, it is essential to integrate stakeholders from the outset of the planning process to ensure their needs and concerns are addressed. A well-structured communication plan serves as a roadmap for guiding these interactions and fostering collaboration between all parties involved in the energy renovation process. Stakeholders should be engaged early in the process, as their involvement from the beginning builds trust and allows them to contribute to identifying challenges, goals, and priorities for the renovation. This early engagement helps prevent misunderstandings and creates a sense of ownership among those affected.

Clear communication channels are vital. Whether through in-person meetings, digital platforms, workshops, or surveys, there should be multiple ways for stakeholders to provide feedback, ask questions, and stay informed. These communication tools should be accessible and designed to encourage ongoing dialogue. Consistency in providing timely updates on the project's progress, including costs, timelines, and potential benefits, is essential for maintaining

transparency and confidence. When stakeholders are kept informed, they are more likely to support the final decisions. An important aspect of this communication plan is the creation of feedback loops, allowing stakeholders to offer input at key stages of the planning process. This input should be actively considered and incorporated where possible, aligning with the iterative nature of Design Thinking. By fostering a two-way dialogue, the plan ensures that stakeholder feedback is not only heard but also integrated into decision-making, resulting in outcomes that are more aligned with their expectations.

Tailoring communication to different audiences is another key consideration. Each group, from technical experts to homeowners, will have varying levels of understanding and interest in the details of the renovation. The communication strategy must be flexible, providing detailed technical information where necessary while simplifying complex concepts for those who may be less familiar with the subject matter. This ensures that all parties feel equally informed and included in the process. The communication plan should also encourage consensus-building. This can be achieved through collaborative discussions, where all stakeholders are given the opportunity to share their perspectives and contribute to the development of shared solutions. Small group discussions or workshops can be effective in identifying common goals and resolving potential conflicts. Visual aids and tangible communication tools, such as diagrams, models, or virtual simulations, are particularly useful in helping stakeholders visualize the impacts of different renovation measures. These tools make abstract concepts more accessible, enhancing understanding and engagement. By following these guidelines, the communication plan ensures that the process leading up to the final decision on which energy renovation measures to implement is inclusive, transparent, and collaborative. This approach increases the likelihood that the chosen measures will be accepted and supported by all stakeholders, ultimately contributing to the success of the renovation project. In this paper, we outlined a general communication model that follows a structured process, moving from initial input and motivation through discussion to decision-making.

This model emphasizes the importance of a neutral instance to moderate the process, particularly in the case of Homeowner Associations (HOAs), where a neutral facilitator can help ensure that all stakeholders are heard and that discussions remain balanced. Additionally, we proposed communication recommendations that could serve as guidelines for setting up such a communication plan, ensuring inclusivity and transparency. To engage all stakeholders effectively, it is important to employ a variety of participation instruments, both offline and online. These tools help ensure that all parties have the opportunity to engage with the process, form an attitude toward the proposed energy renovation measures, and express their viewpoints. The use of different communication platforms also accommodates varying preferences and schedules, making participation more accessible. By following these recommendations, the communication model aims to increase the likelihood that apartment owners, particularly in an HOA context, will arrive at an informed decision. The approach also fosters greater acceptance of the final decision, as all owners will have had the chance to contribute to the process and understand the reasoning behind the chosen measures. Ultimately, this leads to more effective decision-making and a higher level of stakeholder satisfaction.

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