Designing business model for social acceptance

1. Eduardo Méndez-León a

eduardo.mendez@ibero.mx

a Universidad Iberoamericana Ciudad de México, Business Studies Department. Prolongación Paseo de la Reforma 880, Col. Lomas de Santa Fe, Álvaro Obregón, Mexico City 01219, Mexico.

2. Anne-Lorene Vernay b*

Anne-lorene.VERNAY@grenoble-em.com

b Grenoble Ecole de Management

12 rue Pierre Sémard, 38000 Grenoble, France.

3. Carine Sebi b

Carine.SEBI@grenoble-em.com

b Grenoble Ecole de Management

12 rue Pierre Sémard, 38000 Grenoble, France.

Résumé :

Obtaining social acceptance is key for new renewable energy infrastructures. While research has analyzed factors facilitating and hindering acceptance, its impact on companies' practices remains limited. Research findings are often nuanced, context-dependent, and sometimes contradictory, making actionable insights for practitioners difficult. This paper addresses this gap by integrating social acceptance with business model literature to propose the Business Models for Social Acceptance (BMfSA). We perform a literature review identify social acceptance factors and qualitatively analyzing them based on whether they explain business model antecedents or design phases. This led to seven propositions guiding firms in designing a BMfSA. By shifting focus from stakeholders' perceptions to firms' strategic design choices, this study contributes to social acceptance literature and provides a framework for integrating indirect stakeholders into business model. Results provide actionable insights for companies and inform policy recommendations for fostering socially acceptable renewable energy projects.

Mots-clés : Business model; Social acceptance; Renewable energy; Antecedents; Design

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INTRODUCTION

Decarbonizing our energy systems is key to mitigate climate change (van Vuuren et al., 2011). Doing so will require building new infrastructures to produce, transport, store and distribute renewable energy (RE) (Mercure et al., 2014). Extensive research shows that lack of social acceptance (SA) slows down and may even prevent the implementation of new infrastructures (Lind et al., 2025; Segreto et al., 2020). Besides, it also creates high additional costs —estimated to be between 10 and 33% (Jarvis, 2021). Scholars argue that the level of SA will be key in defining the degree to which different sectors can be decarbonized (Baur et al., 2022). Consequently, finding out what can be done to increase the SA of RE projects has become a major concern of practitioners, researchers and policy makers (see Caporale & De Lucia, 2015). SA is a positive behavior supporting the implementation and use of RE technologies (Emmerich et al., 2020; Kraly et al., 2022). Scholars have extensively investigated factors promoting or hindering the SA of RE projects (e.g., Rand & Hoen, 2017) and showed that opposition and acceptance are explained by the perception of negative or positive externalities of RE projects (Rafiq et al., 2022). Studies also show that SA is influenced by individuals' socio-demographic characteristics (Bourcet, 2020), the type, size (Bourdin & Delcayre, 2024) and location of the infrastructure (Devine-Wright, 2008), whether the focal company (or project developer) leaves space for local actors to participate in decision-making processes (Mazzanti et al., 2021) or whether decisions are perceived as being fair (Gross, 2007).

Previous research on SA points that, because perceptions of RE project are influenced by a combination of factors (Wolsink, 2018), it is very difficult to find generalizable solutions that can ensure SA. Besides, studies often nuance previous results or may even contradict each other (Leer Jørgensen et al., 2020; Rand & Hoen, 2017). What makes a project socially acceptable remains case by case-specific. Moreover, studies tend to focus on understanding the perception of stakeholders affected by a RE project (Wolsink, 2018) and scholars have criticized the lack of research translation into changes in focal companies' practices (Rand & Hoen, 2017) pointing to a lack of a conceptual framework that focal companies can use when planning RE projects (Zaunbrecher & Ziefle, 2016) By taking a firm's perspective, this paper intends to use SA research to inform firms that want to develop RE project about how they should think about and design these projects.

We propose to do that by adopting a business model (BM) lens. A BM is a tool scholars use to represent how a company creates, delivers and captures value (Decker & Obeng Dankwah, 2023). It is a structuring perspective that can be used to describe the activities and governance of a complex multi-stakeholder system (Lashitew et al., 2022). A BM lens has been extensively used i) to analyze how firms can commercialize sustainable (energy) technologies (Bohnsack et al., 2014; Reis et al., 2021) or ii) to define how firms can create, deliver and capture value while taking into consideration the social and environmental impact of economic activities (Neesham et al., 2023; Schaltegger et al., 2016). However, despite the few exceptions (Eskelinen et al., 2022), BM scholars paid little attention to what it takes to design BM when indirect stakeholders have the power to prevent the materialization of the BM (Fraser et al., 2021). In this paper, we propose combining SA and BM in order to develop a framework that can help firms design what we propose calling a business model for social acceptance (BMfSA). BM literature informs us that there are four antecedents that shape how a BM will be designed: the goals, templates of incumbent, stakeholders' activities, and the environmental constraints (Amit & Zott, 2015). Additionally, scholars suggest that Design Thinking (DT) provides a structured approach to guide firms in designing new BMs (Geissdoerfer et al., 2016) or innovating existing ones (Bonakdar & Gassmann, 2016), particularly by framing the process through iterative problem-solving and user-centered methodologies. In this paper, we conduct a literature review in order to identify all the SA factors that have been put forward by scholars. We then classify these factors depending on whether they explain the antecedent of a BMfSA or the process firms may follow when they want to design a BMfSA.

This paper contributes to SA literature by adopting a firm-level perspective and informing what it means to design BMfSA through seven propositions. It also adds to BM literature by showing how firms can think on their BM to address negative impacts on indirect stakeholders. While focused on RE projects, the findings apply to any BM requiring SA, such as mining or large industrial projects. Lastly, it offers practical and policy recommendations.

The paper is structured as follows: Section 2 reviews the literature on SA and BM. Section 3 details our method for reviewing and classifying SA factors. Section 4 presents the results and framework. Section 5 discusses implications.

1. LITERATURE REVIEW

Les titres des paragraphes principaux (niveau 1) comprenant Introduction, Conclusion et Références sont en Times New Roman 12, gras, majuscules, interligne double, justifié.

1.1. SOCIAL ACCEPTANCE OF RENEWABLE ENERGY TECHNOLOGY

Ongoing energy transition requires the development of new RE infrastructures (incl. power plants, electricity transport and distribution line, etc.). Scholars and policy makers have raised concerns that public stakeholders may not be willing to accept these new infrastructures and that this may jeopardize the energy transition (Baur et al., 2022; European Commission, 2025; Kânoğlu-Özkan & Soytaş, 2022). Studies already show that SA creates high additional costs (Jarvis, 2021), causes important delays or leads to projects being abandoned (Conseil Économique, 2022; Lind et al., 2025).

From NIMBYism to more nuanced perspectives on the subject, the past decades have seen numerous publications aiming to understand what explains the lack of SA or RE project (Pigeon et al., 2021; Rand & Hoen, 2017; Segreto et al., 2020). SA in the energy sector, is a positive behavior supporting the implementation and use of RE technologies (Emmerich et al., 2020; Kraly et al., 2022). (Wüstenhagen et al., (2007) posit that SA emerges from stakeholders from the socio-political, community and market dimensions. The socio-political dimension concerns the acceptance at the broadest level by the general public, key stakeholders and policy makers (Wüstenhagen et al., 2007). Community acceptance implies the support by residents and local authorities (Hogan et al., 2022). Market acceptance means the endorsement by consumers and investors (Nkundabanyanga et al., 2020).

SA depends on the perception stakeholders have about the positive (ex. job creation or tax revenues) or negative impacts (ex. environmental or landscape degradation) associated with the energy infrastructure (Weitzman et al., 2023) and how energy projects incorporate stakeholder's conditions and expectations (Ahmed et al., 2020). In the literature, stakeholders' conditions and expectations concerning infrastructure projects are generally named acceptance factors (Kraly et al., 2022). Scholars have identified a wide variety of acceptance factors including psychological (Dessi et al., 2022; Huijts et al., 2012), institutional (Agúndez et al., 2022; Wolsink, 2018), economic (Bourcet, 2020), territorial (Bourdin et al., 2020; Meyerhoff et al., 2010), political (Chailleux, 2019; Friedl & Reichl, 2016) and processual (Rand & Hoen, 2017; Wüstenhagen et al., 2007) factors.

However, there is still no consensus about which factors are necessary or appropriate to obtain SA in the RE sector. As stated by Heiskanen et al. (2008, p. 77) "the success or failure of a project is always the result of a unique combination of factors at a specific time, place and environment". In fact, recent results often nuance or even contradict previous findings. This is for instance the case for research about the importance of demographic characteristics of SA that appears inconclusive (Rand & Hoen, 2017). Similarly, scholars found diverging results about preferences for individual or collective compensations (see Lienhoop (2018) vs Knauf (2022)) or about the importance of place identity in explaining SA (see Liebe and Dobers (2019) vs Devine-Wright (2013)).

Likewise, scholars reported that research had a limited impact on the practices of focal companies (Rand & Hoen, 2017). The case-by-case condition, along with the fact that SA is multidimensional (Wolsink, 2018) may explain why it is difficult for focal companies to integrate research findings. Besides, scholars also pointed to a lack of an overarching conceptual framework that focal companies can use when planning RE projects (Reusswig et al., 2016; Zaunbrecher & Ziefle, 2016). In this paper, we propose addressing this gap by adopting a firm's perspective, integrating SA factors in a BM lens and developing a conceptual framework to help design what we call a Business Models for Social Acceptance (BMfSA).

1.2. DESIGNING BUSINESS MODELS

In this paper we build on the activity-system approach which defines a BM as a system of interdependent multi-stakeholder activities all centered around a focal firm to purposively create and capture value (Zott & Amit, 2010). According to this perspective, designing a BM involves deciding which activities to prioritize, organizing these activities and defining which stakeholders is best equipped to undertake and manage them (Zott & Amit, 2010). Furthermore, these activities are structured to shape the value proposition, a key concept in BMs representing a special combination of products, services, and benefits to satisfy stakeholders' needs while forming the basis of the firm's competitive advantage (Hausdorf & Timm, 2024; Richardson, 2008).

Designing a BM is a pivotal driver of firms' success (Zott & Amit, 2007). BM studies aim at helping practitioners design BM that are more appealing to the firms' direct stakeholders (e.g., shareholders, customers, suppliers) (Zott & Amit, 2010). However, SA research highlights challenges from indirect stakeholders—such as local communities, regulators, and advocacy

groups—who can impact a project's success. We argue that research on BM design can be informative in integrating the perspective of indirect stakeholders when designing BMfSA.

In this regard, Amit and Zott (2015) showed that key in influencing BM design are four antecedents: goals to create and capture value, stakeholders' activities, environmental constraints and template of incumbents. Goals to create and capture value require generating adequate value proposals for all stakeholders to reduce the risk of them leaving for a competitor (Amit & Zott, 2015). Stakeholders' activities emphasize the importance of allocating activities among different stakeholders. Environmental constraints highlight the need to consider the external (e.g., economic, legal, sociopolitical and regulatory conditions) and internal (availability of resources or capabilities) elements that affect the BM design (Amit & Zott, 2015).

The antecedent of template of incumbents stipulates copying or imitating aspects of an existing BM that has proven to work for another company or in another context to ensure economic efficiency (Amit & Zott, 2015). Templates may be existing BM that firms can use as recipes to imagine their own (Ramdani et al., 2019; Sabatier et al., 2010). They may also be tactics that firms can use to reconfigure their value proposition and increase market attractiveness (Bohnsack & Pinkse, 2017; Vernay et al., 2020). For instance, compensation tactic aims to shift the customer's negative perception of the company's value proposition, compared to that of an incumbent, to achieve parity. Enhancing tactic carries the same virtue, but exploits points of superiority of the company's value proposition compared to that of the incumbent and transforms them into points of opportunity. Coupling tactic involves the creation of a completely new value proposition, making it the most complex of all tactics. While compensating and enhancing tactics reconfigure the value proposition of the BM by comparing the focal company with incumbents, coupling does so by integrating value propositions from partners in other industries.

Moreover, BMs scholars have also proposed using design thinking (DT). DT is considered a process for solving problems through a human-centered and creative approach (Tschimmel, 2012). Identifying and defining, ideating and prototyping are the three fundamental phases in this process (Liedtka, 2015). DT provides valuable insights for BM design. For example, when academics replicate its phases (Bonakdar & Gassmann, 2016), it emphasizes iteration for systematic design of innovative BMs. It highlights the importance of stakeholder involvement, including design experts, key company stakeholders, and multidisciplinary teams, to leverage diverse knowledge, resources and value perspectives (You, 2022). Additionally, DT's phases

can be adapted into collaborative and transdisciplinary processes, underscoring the need for co-creation in BM innovation. Furthermore, DT suggests participatory design activities as essential for refining BM elements, with designers acting as facilitators to incorporate stakeholder feedback (You, 2022).

2. METHOD

To propose a framework for designing a BMfSA, we performed an integrative literature review. This type of research seeks to critically and integratively analyze and summarize relevant literature to develop new frameworks and perspectives on a topic (Torraco, 2005). We adopted six steps from Torraco (2005).

1. *Defining the review scope*. We reviewed articles on SA in the energy sector, given its key role in the energy transition. Our plan, however, also considered papers from other sectors if they offered insights for a more complete understanding.

2. *Conducting the review*. We used the concepts of "acceptance", "acceptability", "analysis", "business model", "business", "energy" and "renewable energy" in multiple combinations for searching papers in ScienceDirect, one of the major databases for peer reviewed studies in social sciences (Froese et al., 2023). Regarding the word "acceptability", this was included in our search as it is one main variant of "acceptance" (see Lee et al., 2017; Weitzman et al., 2023). The inclusion of "business model" and "business" in our search aimed to identify and inspect the existence of studies on BMs for social acceptance outside the energy sector.
We searched for academic publications in English in titles, abstracts and keywords within the period 2010-2023, retrieving 157 papers. After removing duplicates, 141 remained. We then screened abstracts, keywords, and main texts, selecting papers that met at least one of the following conditions: (i) mentioned, listed, or defined factors hindering or facilitating SA in the RE sector; (ii) examined SA in relation to the BM concept; or (iii) explored SA in relation to the BM specifically within the RE sector. This yielded 42 articles. Later, 11 were included through cross-referencing, bringing the final sample to 53 documents.
Finally, we included 44 papers during coding analysis as explained in the step 4 of this method section. Thus, the final sample for our review includes 97 papers which can be consulted in Appendix A.

3. Identifying SA factors. We completely reviewed the final sample to identify SA factors. In some cases, we summarized key points by writing notes, but most factor descriptions were kept as originally written to preserve the authors' exposition. We compiled a list of factors along with article details, including title, authors, year, and journal.

4. *Coding SA factors*. To reveal how to design a BMfSA, we deductively coded the list of SA factors. In our research, coding involved matching our SA factors with the antecedents of BM design (Amit & Zott, 2015), which were considered deductive codes. Later, we randomly selected and analyzed a short list of 5 papers to compare our deductive coding; this ensured the use of similar processes by us to assign a code (BM design antecedents) to each SA factor. Once we agreed on the way of coding, we progressively coded our list of SA factors.

We realized that some factors fitted the antecedents. For instance, regarding the antecedent of goals to create value, we identified various references to what should be the purpose of the BM design process. In these cases, we tried to interpret what was specific for a BMfSA and found that scholars often stressed the asymmetry between various stakeholders and the need to reduce it. A similar approach was taken for the antecedent of environmental constraints. Other SA factors related to, but did not fully fit, the two remaining antecedents: template of incumbents and stakeholders' activities. This led us to re-interpret them by exploring other approaches in the context of designing a BMfSA.

In the case of the template of incumbents, we found that scholars never talk about the entire template that one can copy. However, they often studied specific tactics that focal companies can use to increase the SA of their project. We organized these tactics following an existing typology developed for reconfiguring value propositions in disruptive innovations (Bohnsack & Pinkse, 2017; Vernay et al., 2020). To this, we added a fourth one stemming from our reading of the codes: the limiting tactic, which minimizes perceived negative externalities for local indirect stakeholders.

Concerning stakeholders' activities, we found that SA literature considers mostly stakeholders that grant acceptance to a BM. We drew on a stakeholder management approach that shows that a first attribute is their level of preference (weak or strong). While reading about the stakeholders granting acceptance, we identified another attribute which is their profile (normative or dogmatic). In doing so, we intended to understand the capabilities of indirect stakeholders to hinder energy projects and consequently develop strategies to counter them

through a matrix. Appendix B exhibits the way SA factors were deductively analyzed though these codes.

Our analysis also revealed that many codes did not represent antecedents but rather processes the focal company should follow to design an acceptable energy project. To interpret these process-related SA factors, we drew on the three generic phases of DT (Liedtka, 2015). While these phases guided our analysis, we applied them within a process logic rather than as deductive codes. Instead, we adopted an inductive approach, analyzing our remaining codes by determining which design process they best related to. Unlike deductive coding, which applies predefined academic terms, inductive coding frames the researcher's interpretation based on observed patterns (Saldaña, 2013). See Appendix C.

As we identified key themes via coding (e.g., compensation or diversity on stakeholders' profiles), we searched for more papers on these topics in the SA context to ensure no key insights were overlooked at this stage. This added 44 papers, bringing our final sample to 97.

5. *Interpreting codes and themes*. After coding all identified SA factors, we grouped them based on their assigned code. Using active reading and an inductive approach (Côté & Evans, 2023), we identified themes within these labeled factors. In our analysis, we interpret themes as key aspects of BM design antecedents and DT phases that may impact BMfSA design. Some SA factors clearly aligned with BMfSA design, while others provided hints that, when grouped, formed meaningful patterns. In these cases, identifying themes required conceptual thinking and theoretical assimilation, involving comparison between emerging themes and existing on antecedents and DT phases. This process helped us create tables linking codes and themes (Appendix B and C) and develop our BMfSA design framework (Figure 1).

The authors' experience in the energy sector was essential for interpreting codes and themes. This expertise, gained through discussions and interviews with various sector actors, helped to form a more comprehensive understanding of the data.

6. *Reliability*. Two authors independently analyzed the codes and themes using separate Excel files. They then compared their results, discussed any discrepancies, and reached full agreement. Finally, we presented our results to professionals from the energy sector (e.g., project developers, network operator).

3. RESULTS

We present our findings as follows. Section 4.1 presents the antecedents for designing a BMfSA. Section 4.2 shows the different phases to design it. In each section, we conclude with a proposition summarizing what this means for BMfSA. These results are integrated and presented as a framework for designing a BMfSA in Figure 1.

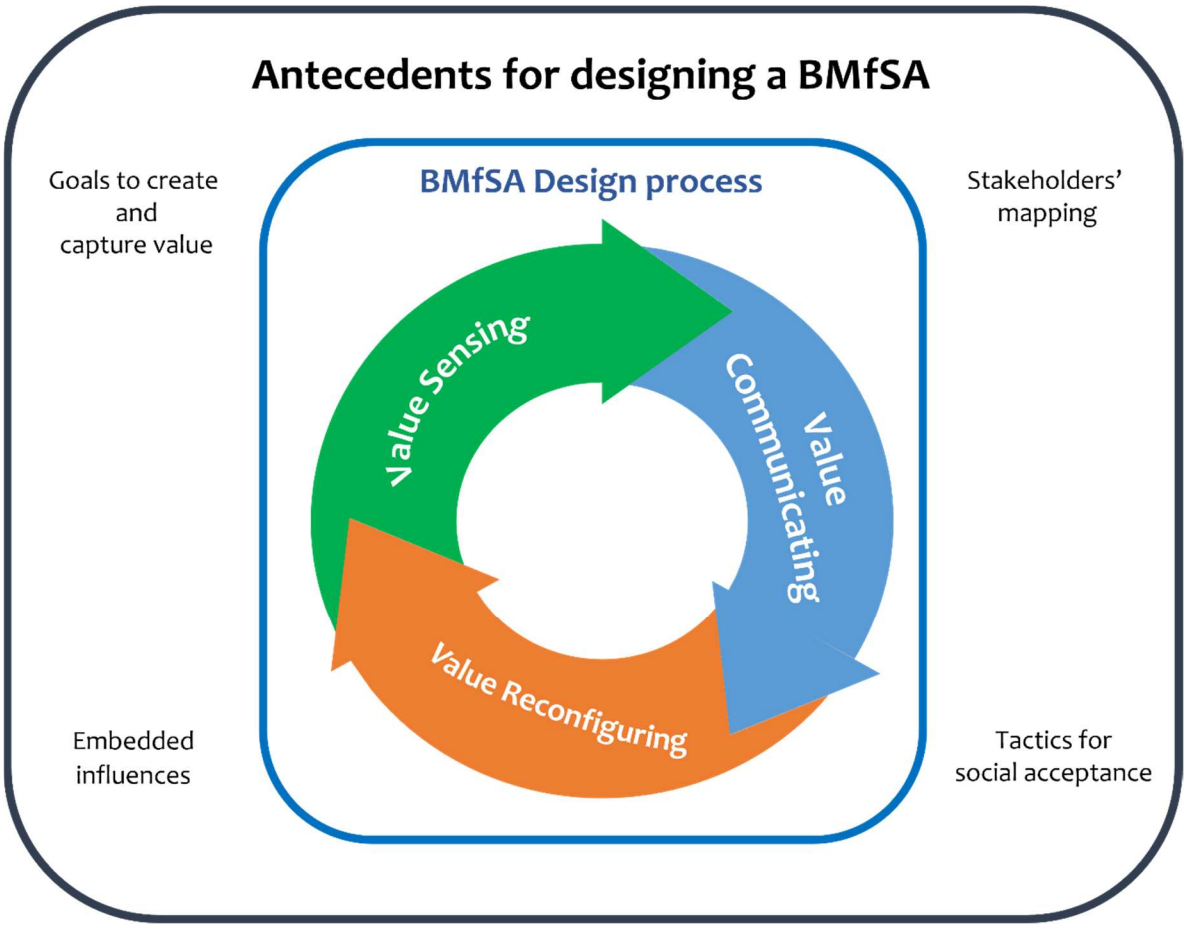


Figure 1. Framework to design a BMfSA integrating phases and antecedents.

3.1. THE ANTECEDENTS FOR DESIGNING A BMFSA

Based on our review, we identified four antecedents for designing a BMfSA: goals to create value, mapping indirect stakeholders, embedded influences and tactics to improve SA. Appendix B provides additional evidences for each of the antecedents.

3.1.1. Goals to create and capture value

A first antecedent of BMfSA relates to the goals the company has regarding value creation and capture. For BMfSA, it is necessary to consider not only direct but also indirect stakeholders. Indirect stakeholders are those that, while not directly targeted by the BM, may experience its (often negative) externalities. This includes local communities, farmers and government (Kim et al., 2021; Lee et al., 2017; Weitzman et al., 2023), policy makers (Knauf & le Maitre, 2023; Lyu, 2020; Wang et al., 2018) and even nature (Lee et al., 2017; Lennon et al., 2019; Rafiq et al., 2022).

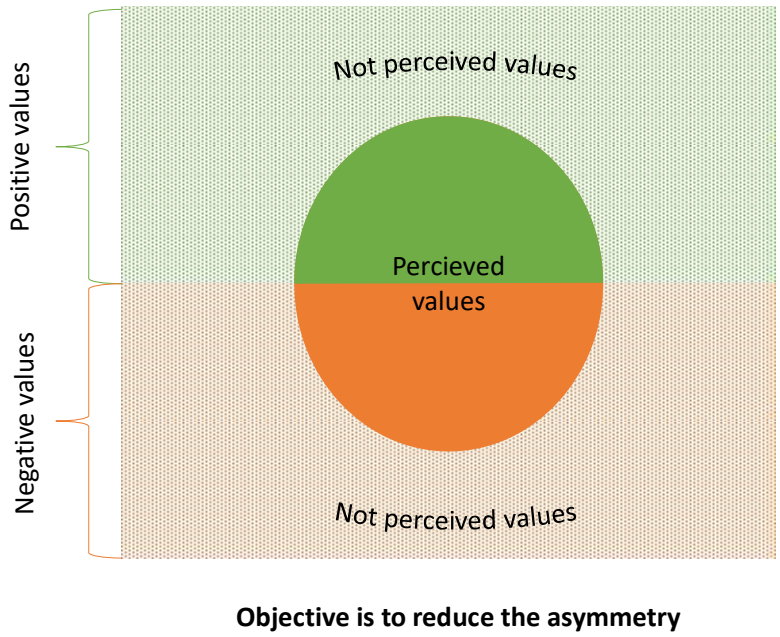


Figure 2. Goal to create and capture value in a BMfSA

Our analysis reveals that for BMfSA, an important goal should be to reduce the asymmetry between stakeholders that benefit from and stakeholders that perceive the negative externalities of the BM (see Figure 2). Indeed, while BMfSA often create broad values aiming to satisfy public needs or concerns (e.g., quality and security of energy supply (Rafiq et al., 2022), fighting climate change (Devine-Wright, 2008) or community promotion and nature conservation (Lyu, 2020)), they may also destroy value when they result in negative impacts, such as generating noise, odor, causing local biodiversity loss, landscape degradation, or having negative impacts on tourism and real estate prices (e.g., Dessi et al., 2022; Lee et al., 2017; Lennon et al., 2019). Besides, these negative values mostly concern local stakeholders that often

perceive the consequences as value destruction rather than value creation (Bourdin & Delcayre, 2024; García et al., 2016). Firms designing BMfSA should aim to identify ways "to redress imbalances in the distribution of costs and benefits." (Devine-Wright, 2008, p. 8).

Proposition 1: The focal company should aim at creating value for both direct and indirect stakeholders, and reducing the asymmetry between those who perceive value creation and those who experience value destruction.

3.1.2. Mapping indirect stakeholders

As mentioned, indirect stakeholders play a crucial role in a project's acceptance or rejection. Our review identifies two key attributes for understanding which stakeholders may grant SA. Based on this mapping, we define four stakeholder profiles and suggest specific strategies for focal companies to manage them effectively.

The first attribute relates to whether stakeholders have strong preferences (either in favor (referred to as proponents) or against (opponents)) or weak preferences for the technology that is considered (Bertsch et al., 2016; Borch et al., 2020) Research indicates that experience plays a role in strengthening preferences, as both proponents and opponents report having more direct experience with the technology compared to those with weak preferences (Knauf, 2022). Furthermore, the influence of small but vocal opposition can reinforce the presence of strong preferences (Lindvall, 2023). Similarly, Borch et al. (2020)found that online discourse was dominated by opponents while supporters remained largely silent. On the other hand, stakeholders with weak preferences are those that do not have a strong opinion either in favor or against the technology. They may also be more likely to shift their stance when faced with a specific local project or be influenced by a small but vocal opposition (Knauf, 2022; Lindvall, 2023; van der Horst, 2007). Stakeholders with weak preferences also have lower levels of prior information on the technology (Knauf, 2022).

As second attribute, we propose mapping whether stakeholders are pragmatic or dogmatic. These dimensions stem from the understanding that values, norms and beliefs are likely to affect SA of RE technologies (Bourcet, 2020; Upham et al., 2015) because they influence individual's mental attitude (Stigka et al., 2014). Scholars found many factors that influence individual's beliefs including political preference, income level, educational level, age group, gender, identity, emotional bond with nature (Antwi & Ley, 2021; Bourcet, 2020; Devine-Wright, 2008; Rafiq et al., 2022; Vlassenroot et al., 2008). Pragmatic stakeholders are then those who

are "*prepared to accept what developers might offer"* (Goedkoop & Devine-Wright, 2016, p. 144). They are willing to negotiate with the focal company and may be convinced to accept a RE project even if it contradicts their prior belief as long as they perceive that it creates sufficient positive benefits (Huijts et al., 2012). Dogmatic stakeholders are those that will stay true to their prior belief (be it positive of negative) about the technology (van der Horst, 2007). When they are opposed to a technology, they are also not willing to negotiate with the focal company. This is illustrated by (Mazzanti et al., 2021, p. 13) who explains that *"prior beliefs on the negative impact of the opening of new biogas plants [...] are not reduced by higher biogas knowledge or by participatory processes and informative campaigns"*. This may also be explained with situations where burden expected by local residents "*in their daily lives, such as tranquillity, were not commensurable with monetary compensation*" (Leer Jørgensen et al., 2020, p. 9).

Stakeholders can be categorized based on the strength of their preferences (*strong* or *weak*) and their approach to engagement (*pragmatic* or *dogmatic*), resulting in four distinct profiles. Table 1 shows these stakeholders' dimensions. When considering strong preference, we focus on "opponents" as proponents are unlikely to cause SA problems. "The *Unyielding Opponent*" (profile 1) represents stakeholders who hold rigid views and are unlikely to change their stance, even when presented with new information. The focal company should counteract their arguments and reframe the debate, leveraging elements of their discourse to strengthen its position rather than directly confronting them. "*The Hard Bargainer*" (profile 2) describes stakeholders who hold firm views but remain open to negotiation if they perceive tangible benefits (Goedkoop & Devine-Wright, 2016). The best approach is to engage in strategic negotiation, offering tailored incentives that align with their interests while reinforcing the project's value. "The *Passive Follower*" (profile 3) consists of individuals who lack strong convictions but can be swayed by dominant narratives, may change their opinion when confronted with concrete proposals, particularly if opposition narratives gain traction (van der Horst, 2007). Since these stakeholders may radicalize over time, the focal company should avoid escalation, limiting their exposure to polarizing debates and preventing them from reinforcing their opposition. Finally, "The Swing Voter" (profile 4) represents those who are the most susceptible to shifting positions when confronted with new information (van der Horst, 2007). For these stakeholders, transparent communication is key to keeping them informed and reassured, ensuring they perceive sufficient benefits to remain neutral or positive toward the project.

Proposition 2: The focal company should anticipate encountering different types of stakeholders based on their level of preference (weak or strong) and their profile (dogmatic or pragmatic). It should develop strategies to manage these profiles during the design phase.

Table 1. Stakeholders' mapping according to preferences and engagement, and focal company targeted strategies to maximize project acceptance.

	DOGMATIC	PRAGMATIC
STRONG PREFERENCE	Profile 1: "The unyielding opponent" FC strategy: Counteract & Reframe	Profile 2: "The Hard Bargainer" FC strategy: Negotiate & Leverage
WEAK PREFERENCE	Profile 3: "The Passive Follower" FC strategy: Avoid escalation	Profile 4: "The Swing Voter" FC strategy: Transparent communication

3.1.3. Embedded influences

The last key antecedent of BMfSA revealed from our literature review is embedded influences, structured at both local and national levels (Batel, 2020; Heiskanen et al., 2008).

To begin with, various authors have shown that place attachment and place identity are very influential in defining SA of sustainable technologies (Dessi et al., 2022; Devine-Wright, 2009; Fast & Mabee, 2015; Liebe & Dobers, 2019; Moula et al., 2013). Place attachment refers to the emotional bonds that people establish with their communities or with specific locations (Giuliani, 2003) while place identity refers to how the physical or symbolic attributes of a location contribute to an individual's sense of self (Proshansky et al., 1983). People are for instance likely to oppose a project that they perceive as a threat to their local cultural identity and traditions (Devine-Wright, 2008; Kraly et al., 2022) or because it negatively impacts the rural landscape to which they are attached (Meyerhoff et al., 2010). As such, whether an area has industrial roots or on the contrary is appreciated for its rural landscapes, will influence the SA of RE projects (Bourdin & Delcayre, 2024).

Moreover, scholars also frequently highlight that trust in the actors responsible for the technology significantly influences SA (Antwi & Ley, 2021; Dessi et al., 2022; Friedl & Reichl, 2016; Moula et al., 2013; Rand & Hoen, 2017; Reigstad et al., 2022; Weitzman et al., 2023). This includes trust in the industry at large or in focal companies specifically (Bourdin et al.,

2020; Huijts et al., 2012; Soland et al., 2013), as well as trust in regulators or in local municipalities overseeing the industry or individual projects (Devine-Wright, 2008; Emmerich et al., 2020; Kraly et al., 2022; Reigstad et al., 2022), particularly when local communities perceive a pro-technology bias from focal companies or regulators (Aitken, 2010). Heiskanen et al. (2008) also note that trust can be embodied in specific individuals, stating that *"the attitude of the mayor towards the project in his/her community can influence the attitude of other local stakeholders and thereby influence the project itself, depending on the trust attributed to this person by the local residents"* (p. 84). Last but not least, positive or negative past experiences have also been shown to influence SA (Eikeland et al., 2023; Heiskanen et al., 2008).

Finally, institutional frameworks at the national or local levels also influence SA of RE projects, as they can promote or hinder their implementation (Fast & Mabee, 2015; Wolsink, 2018). These policies are varied, but financial policies dominate, presenting both opportunities and barriers that have effect on the location, use of technology, size or duration of energy projects (Heiskanen et al., 2008). Another political issue that affects SA is the interaction between national and local policymakers. For instance, a municipal institutional framework may locally prevent the implementation of RE project, even if it is supported by national framework (Friedl & Reichl, 2016). Similarly, conflicts may arise between policymakers, as illustrated by Lind et al. (2025) who report that licenses *"are now entrenched in municipal planning, which means two authorities are involved in permitting"* (p. 25).

Proposition 3: SA is context-specific, and the focal company can anticipate the level of opposition by assessing stakeholders' place attachment and identity, prior levels of trust, as well as national and local institutional support.

3.1.4. Tactics for social acceptance

Our analysis of SA factors reveals many different tactics that focal companies can use to address the abovementioned asymmetries and make RE projects (more) acceptable. In the SA literature, this is often referred to as distributional justice (Antwi & Ley, 2021; Cowell et al., 2011; Lennon et al., 2019; Mazzanti et al., 2021; Soland et al., 2013), and much research looks at whether various forms of compensations work. Inspired by Bohnsack and Pinkse (2017) and Vernay et al. (2020), this paper proposes organizing these tactics in four distinct categories depending on

whether and how the tactics aim to influence perceived positive or negative values: limiting, compensating, reinforcing, and coupling.

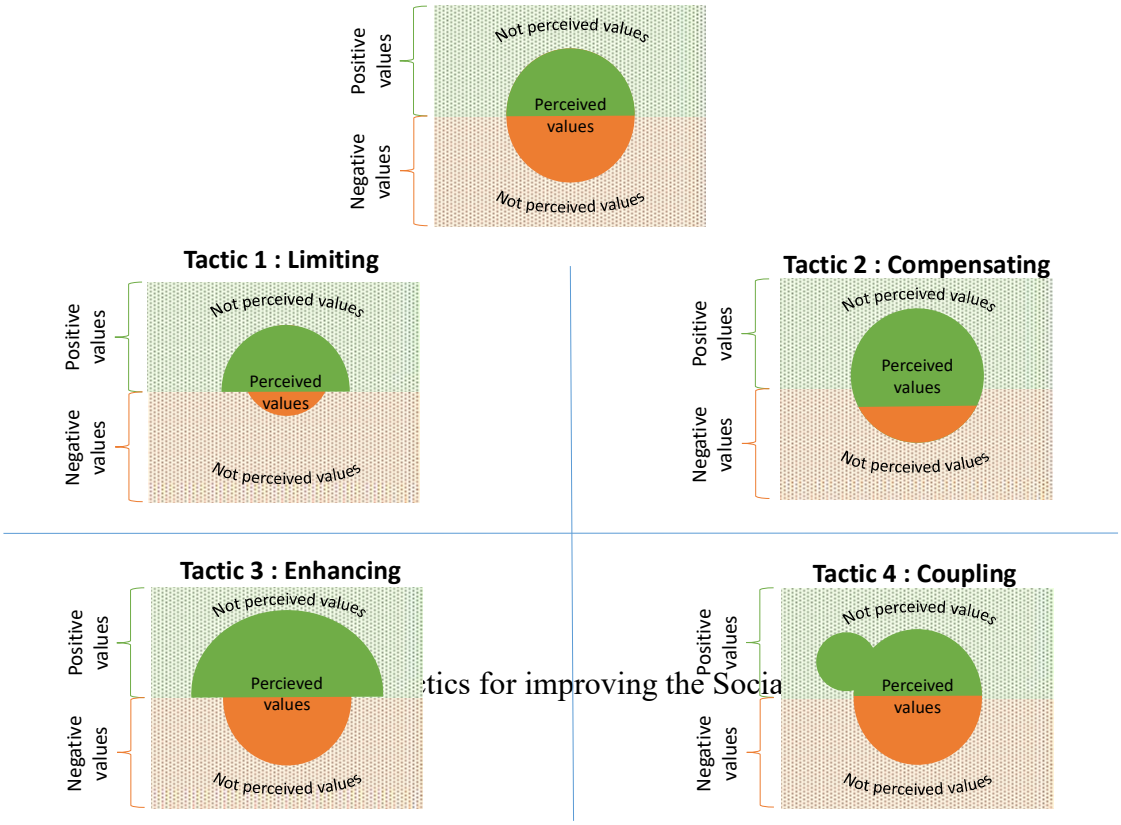
The limiting tactic, consists of designing projects in a way that minimizes the perceived negative externalities by local stakeholders (Kraly et al., 2022; Lee et al., 2017; Lennon et al., 2019; Lyu, 2020). Projects may, for example, be located further away from residential areas (Kim et al., 2021), or in areas with suitable infrastructures (Bourdin & Delcayre, 2024). They can also avoid areas where there is a risk for high biodiversity loss (Ek & Persson, 2014; Mariel et al., 2015; Vuichard et al., 2022). Project may also be scaled down in size (Devine-Wright, 2008; Lennon et al., 2019) or integrate technical solutions to minimize olfactory pollution (Soland et al., 2013), sound pollution or landscape degradation (Bush & Hoagland, 2016; Müller et al., 2023; Rand & Hoen, 2017). Limiting tactics directly alter the RE projects and its implementation.

The compensation tactic refers to measures taken by focal companies that acknowledge their project causes negative values and aim to decrease perceived negative impacts of their projects on local stakeholders. Compensation may be financial (ex. a one-time financial allowance) (García et al., 2016; Kim et al., 2021; Liu et al., 2021), or include any type of *"exchange negotiated between two or more actors within an institutional framework that governs the exchange"* (van Wijk et al., 2021, p. 2). For instance, companies may offer housing relocation (Liu et al., 2021) or discounts on electricity bills (Rand & Hoen, 2017; van Wijk et al., 2021). Some studies also showed that people may favor compensation given to municipalities rather than private individuals (Lienhoop, 2018), though later studies suggested private compensations are preferred (Knauf & le Maitre, 2023).

Reinforcing tactics consist in increasing perceived positive impacts by using the project to respond to unmet local values. For instance, focal companies can share ownership of the production asset with the local community (Knauf & le Maitre, 2023) or allow citizens to co-invest in the project (Knauf & Wüstenhagen, 2023) so that "*control of the project [rests] with the community*" (Lennon et al., 2019, p. 4). Finally, they may also preferentially hire local manpower (Lyu, 2020) or create indirect benefit such as "*the creation of employment opportunities involving local businesses and the regional supply chain"* (van Wijk et al., 2021, p. 2).

Finally, the coupling tactics also allude to increasing perceived positive impact. However, they do that by offering a new and different product that joins the original product for the creation of a coupled value (Bohnsack & Pinkse, 2017). Examples include provision of local public

goods (e.g., sports ground) (García et al., 2016), providing apprenticeships and scholarships for students, educational programs, street lighting, and community welfare arrangements to facilitate SA (Busch & McCormick, 2014; Rand & Hoen, 2017; Rudolph et al., 2018). Lyu (2020) posits that coupling tactics work best when they build on, *"long-term regional development strategies that can revitalize regional communities"* (p. 16). Figure 3 summarizes our findings on these four tactics.



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Proposition 4: The focal company can increase SA by implementing tactics to limit or compensate for the perceived negative values of a RE project while enhancing perceived positive values through reinforcement or coupling tactics.

3.2. PHASES TO DESIGN A BMFSA

SA literature places a lot of emphasis on procedural justice – namely ensuring that people are informed, heard and possibly involved in decision-making regarding RE projects (e.g., Bourdin et al., 2020; Lennon et al., 2019; Soland et al., 2013). This highlights that the process through which BMfSA is designed is as, if not more, important than the resulting BM. The objective of

this design process is to ensure that "*the system is good enough to satisfy all the needs and requirements of the users and other potential stakeholders"* (Vlassenroot et al., 2008, p. 2). Our analysis of the SA factors reveals three underlying phases that enable procedural justice during the design of BMfSA: value sensing, value communicating and value reconfiguring. Appendix C presents our findings on these phases. For visual clarity, Figure 1 depicts these phases as a sequential process, however, they may actually occur simultaneously.

3.2.1. Value Sensing

Designing a BMfSA first requires being sensitive to how stakeholders perceive RE projects because, as summarized by Kraly et al. (2022, p. 5): *"how individuals and the public perceive risks and benefits have long been recognized as major factors predicting the [...] acceptance of projects and technologies".* Scholars have highlighted that perceived risks Knauf & le Maitre, 2023; Pestalozzi et al., 2019), social, economic and environmental damages (Dessi et al., 2022; Lee et al., 2017; Lennon et al., 2019; Rafiq et al., 2022), are often linked to social opposition. It is therefore important for focal companies to understand stakeholders' perception. We propose calling this phase "value sensing".

While customer segmentation is central to BM design, for BMfSA, the focal company cannot focus on a set of customers. Instead, scholars emphasize that the focal company should sense values of a broad range of stakeholders, as long as they are impacted by a RE project. This "*contributes to understanding and improving decision-making [of projects]*" (van der Waal et al., 2020, p. 3). These stakeholders may have very diverse socio-economic profiles all of which influence the perception of RE projects (Antwi & Ley, 2021; Bourcet, 2020; Devine-Wright, 2008; Rafiq et al., 2022; Vlassenroot et al., 2008). For the focal company, value sensing means being willing to hear these diverse stakeholders and showing empathy toward their concerns and worries.

Scholars also discussed how value sensing should be managed. Many studies highlight the importance of starting this phase early on in the process (Mok & Hyysalo, 2018; van der Waal et al., 2020). Other scholars stressed that stakeholders should be allowed "*to express opinions freely and to be heard (voice) [as well as] to be treated with respect*" (Gross, 2007, p. 2730), which influences perceptions of procedural justice. Besides, scholars show the importance of identifying potential value conflicts (de Wildt et al., 2021; Mok & Hyysalo, 2018; Raven et al., 2009) and of creating spaces for constructive value conflicts by encouraging stakeholders to consider each other's perception about a RE project (van der Waal et al., 2020). Finally, it is

essential for the focal company to organize and moderate the participation of project opponents and supporters. (Gross, 2007, p. 2732) illustrates this point when describing a company that failed to manage this activity properly "*people in favor of the wind farm felt that as the opposing voice became louder their voice became more muted and they had concerns that decision-making authorities would get a distorted representation of the community's views*".

Proposition 5: The focal company should assess all stakeholder perceptions and effectively manage value conflicts.

3.2.2. Value Communicating

The second phase that is important during the design of a BMfSA is one we call "value communicating".

Our analysis reveals that communication directly affects the perception and consequently, the SA of projects (Edwards et al., 2021; Kraly et al., 2022; Soland et al., 2013; Stigka et al., 2014; Weitzman et al., 2023). Many scholars recommend that focal companies lead the provision of information to stakeholders because of the positive effects this has on stakeholders' perceptions (Gross, 2007; Horváth & Szabó, 2018; Knauf & le Maitre, 2023; Lennon et al., 2019). Regarding the type of communication for SA, studies suggest that it should be sufficient in quantity (Mazzanti et al., 2021), of high quality (Soland et al., 2013), adequate (Gross, 2007; Pestalozzi et al., 2019), clear, and transparent (Fall, 2022; Lyu, 2020; Weitzman et al., 2023). In general, we found that communication encompasses a variety of methods for providing information, such as dialogues with the public (Pestalozzi et al., 2019), large-scale communication through media (Pode, 2010), information campaigns (Dessi et al., 2022; Knauf & le Maitre, 2023), or direct teaching (Lennon et al., 2019; Syed, 2020). Further, our research indicates that providing information on the progress of projects (Lyu, 2020), the objectives pursued with the application of funds (Fall, 2022), or technologies employed (Horváth & Szabó, 2018; Lennon et al., 2019; Pode, 2010) can improve perception.

SA literature also suggests that communication should have two main objectives. On the one hand, scholars often stress the importance of being transparent about possible negative side effects of RE projects. Transparently informing about those impacts can contradict some false or exacerbated perceptions based on *"danger or anxiety that [intensify] with ignorance"*(Stigka et al., 2014, p. 103). On the other hand, beyond being transparent about possible negative values, scholars also highlight that focal companies should emphasize the positive values

created by energy projects. Referring to the biofuels sector for instance, Dessi et al. (2022, p. 2) notes that *"the adoption of biofuels has, among the positive sides for the local economy, the increase in jobs and therefore in local income. In a study [...] the concern about the location of a biofuel refining plant has decreased in view of deriving economic benefits"*. Energy projects generate multiple positive values; unfortunately, these may not be easily perceived by stakeholders, which significantly impacts SA. This is explained by Horváth and Szabó (2018) who say, *"A poor knowledge base and misinformation about the benefits of renewable technologies [...] influence the deployment of DE technologies more generally"* (p. 625). Communication should, therefore, focus on making these positive values visible to indirect stakeholders.

Proposition 6: The focal company should communicate the project's positive contributions while transparently informing stakeholders about its negative impacts to build trust.

3.2.3. Value Reconfiguring

The final phase which is important during the design of a BMfSA is one we entitle "value reconfiguring". Value reconfiguring may be necessary when simply communicating about of the values created by the project and verbally reassuring stakeholders about the values destroyed by the project are not sufficient to obtain SA. Pestalozzi et al. (2019), for instance, refer to this when arguing that: *"risk perceptions need to be acknowledged and addressed to gain legitimacy and facilitate acceptance"* (p. 13). Value reconfiguring also integrates the idea that the interest of the focal company should be balanced with those of other stakeholders. Raven et al. (2009), for instance explain that when a project manager is not able to align his or her expectation with the expectations of different stakeholders, societal acceptance fails to emerge.

In the section, we will focus on how the focal company should organize this reconfiguration. One way identified by scholars is through various practices that enable the integration of local stakeholder in the decision-making process. This includes consultation (Tu & Yang, 2019), collaboration (Dessi et al., 2022), public and participative planning processes (Bourcet, 2020; Raven et al., 2007; van der Waal et al., 2020), and community involvement in decision-making (Kraly et al., 2022).

Other authors point to the need for the focal company to negotiate with local stakeholders what they need to grant SA (Knauf & le Maitre, 2023; Raven et al., 2007; van der Waal et al., 2020).

This means that focal companies should not consider RE project as purely technical endeavors managed only by technical experts (Chailleux, 2019). Instead, scholars advise that the focal company empower local stakeholders (Lennon et al., 2019), and ensure that decisions are made collaboratively rather than through hierarchical procedures (Dessi et al., 2022). Scholars have also stressed the importance for the focal company remaining impartial in considering stakeholders' values (Gross, 2007) and being cautious when integrating community interests so that this is not interpreted as a bribe (Lyu, 2020).

Finally, research indicated that focal companies may rely on a neutral mediator to facilitate this negotiation phase and build trust with local stakeholders (Lind et al., 2025; van der Waal et al., 2020). This role can be fulfilled by various type of organizations including specialized consultants (Raven et al., 2007) or local authorities (Knauf & Wüstenhagen, 2023; Komendantova & Battaglini, 2016).

Proposition 7: The focal company should integrate stakeholders' values into the BM while ensuring that these efforts are perceived as genuine engagement rather than bribery.

4. DISCUSSION AND IMPLICATIONS

4.1. CONTRIBUTION TO SA RESEARCH

This paper contributes to SA by adopting a firm-level perspective as it integrates SA research with BM literature. Scholars have pointed out that SA research does not sufficiently inform the practices of focal companies (Rand & Hoen, 2017). We posit that this may be because it is difficult to identify best practices that are likely to work for any project. Instead, SA requires a case-by-case approach. Moreover, SA is multidimensional (Wolsink, 2018) and requires considering psychological (Dessi et al., 2022), institutional (Agúndez et al., 2022), economic (Bourcet, 2020), territorial (Bourdin et al., 2020), and political (Chailleux, 2019) factors. While existing frameworks show the influence of these dimensions on SA (Perlaviciute & Steg, 2014; Wüstenhagen et al., 2007), they do not provide concrete guidelines firms should follow when they design RE projects.

This paper fills this gap by proposing an overarching framework firms can use to design BMfSA. This framework provides a structure that helps integrate the multi-dimensional and inter-related dimensions of SA (Wolsink, 2018) in the design process. We also use it to develop a set of propositions that help firms i) anticipate how antecedents for designing the BMfSA are likely to influence the SA of the project and ii) organize the process through

which they can design the BMfSA. Finally, while our analysis highlights where the focal company can intervene to enhance SA (e.g., normalizing the aim to reduce the asymmetry between negative and positive values), it also points to the limit of firm level influence. Public belief about technologies, level of trust in public instances, characteristics of local and national policies, are all example of factors that influence SA. They go well beyond the tactics and practices described in this paper that firms can put in place to improve SA.

4.2. CONTRIBUTION TO BM RESEARCH

Our paper also contributes to enlarging current understanding of what it means to design a BM that works. In conventional models, success is determined by the value proposition for the customer (Richardson, 2008) and by the ability of the focal company to generate sufficient value to retain its customers and stakeholders (Amit & Zott, 2015; Zott & Amit, 2010) strategically combining activities during the design and execution of the BM to make it more competitive. Besides, while many studies considered designing business models for sustainability (Pedersen et al., 2021; Schaltegger et al., 2016) scholars have paid little attention to BM that can only work if indirect stakeholders grant social acceptance. We show that for BM that have to gain SA, the focal company must also consider the expectations of indirect stakeholders. In other words, a BMfSA is a non-customer-based model. Moreover, while previous research showed how firms can manage the process of designing a BM by integrating customers into the design process (Zott & Amit, 2010), this paper extends this by showing how firms can integrate indirect stakeholders in the design of BMfSA.

We also propose a definition of BMfSA based on our results to differentiate it from other archetypes of BMs as follows: The BMfSA is the result of a process through which firms sense, communicate and reconfigure values in order to design projects in a way that reduces the asymmetry between perceived negative and positive values of impacted direct and indirect stakeholders.

Besides, a BMfSA must, in addition to generating positive values and recognizing its impacts, ensure that these are correctly perceived. While other authors have exposed value perception as just another component of sustainable BMs (Aagaard & Ritzén, 2020), our results suggest that value perception by indirect stakeholders is the critical element in a BMfSA. Lastly, as our results show that the success or failure of projects is the result of specific configurations of political and cultural factors, a BMfSA must be understood as a unique entity for a specific context. In a nutshell, designing a BMfSA entails customizing,

for a specific context, the value perception of indirect stakeholders and tailoring a new one each time a new energy project is to be implemented in another community.

4.3. IMPLICATIONS FOR FIRMS

Our analysis helps making a number of managerial recommendations for firms that want to design BMfSA. To begin with, it shows the necessity to routinize listening, integrate the perception of stakeholders and reduce the asymmetry between perceive positive and negative value. Moreover, our antecedents highlight the importance of analyzing early on the characteristics of the local context, of the network of stakeholders in place in order to anticipate and prepare for oppositions.

With the phases for designing a BMfSA, we provide focal companies with a complementary interpretation for projects. An energy project that depends on SA for successful implementation is not just a technical business; it is also a social project that requires the involvement of actors with soft skills. Therefore, integrating people with right profiles is essential for designing a BMfSA. For example, in the value sensing phase, a community leader with legitimacy within the community can be key to understanding the local culture and creating spaces for dialogue to identify stakeholders' expectations and concerns. In the value communicating phase, we speculate that the same leader could facilitate communication between the focal company and local groups. However, a specialist in narratives, media, or social networks could manage the project public image of a broader audience than just the local community. Counteracting misinformation and clarifying the true economic and environmental implications could be the responsibility of an educator. Finally, in the value reconfiguring phase, a negotiator or conflict manager would adjust the project to maximize value for all parties involved.

4.4. IMPLICATIONS FOR POLICY MAKERS

Our analysis identifies two key areas where public policies could provide essential support. The first is communication, as hidden information, misinformation, and a lack of awareness can significantly contribute to local opposition. To mitigate these issues, policymakers should develop national communication campaigns that provide neutral and transparent information on both the positive and negative effects of RE technologies. Furthermore, focal companies would benefit from targeted support through toolkits designed to help them assess the social and territorial antecedents of SA and apply structured processes in the design of

BMs that effectively integrate stakeholder concerns, including various tactics such as financial and non-financial compensation mechanisms.

The second area is the need for a deeper understanding of local community dynamics to anticipate potential opposition. One approach could be the creation of a comprehensive stakeholder database compiling key indicators related to place attachment, including community profiles (e.g., sociodemographic characteristics, political preferences, and trust in public institutions), the economic structure of the region (e.g., urban vs. rural, growing vs. declining economies), historical interactions with similar projects (e.g., whether past RE initiatives succeeded or failed), etc. Such a database would offer valuable insights into local attitudes and concerns, allowing focal companies to refine their engagement strategies and adapt their BMs accordingly.

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Appendix A. List of articles included in this review

Number	Author	Source	Title
1	Agúndez et al. (2022)	Aquaculture Reports	Top-level institutional policies and their implementation at regional level − A difficult equation. The example of the social acceptability of aquaculture development in Malaga, Spain
2	Ahmed et al. (2020)	South Asian Journal of Business and Management Cases	Infrastructure Development Company Limited Solar Home System Program: A Sustainable Solution for Energizing Rural Bangladesh
3	Antwi and Ley (2021)	Scientific African	Renewable energy project implementation in Africa: Ensuring sustainability through community acceptability
4	Bankel and Mignon (2022)	Energy Policy	Solar business models from a firm perspective – an empirical study of the Swedish market
5	Batel (2020)	Energy Research and Social Science	Research on the social acceptance of renewable energy technologies: Past, present and future
6	Becherif et al. (2015)	Energy Procedia	Hydrogen Energy Storage: New Techno-Economic Emergence Solution Analysis
7	Bourcet (2020)	Université Sorbonne Paris Nord	Renewable energy deployment: global determinants and crowdfunding in France
8	Bourdin et al. (2020)	Energy Studies Review	On the (un)successful Deployment of Renewable Energies: Territorial Context Matters. A conceptual framework and an empirical analysis of biogas projects
9	Busch and McCormick (2014)	Energy, Sustainability and Society	Local power: exploring the motivations of mayors and key success factors for local municipalities to go 100% renewable energy
10	Chailleux (2019)	Politics and Space	Making the subsurface political: How enhanced oil recovery techniques reshaped the energy transition
11	Cowell et al. (2011)	Journal of Environmental Planning and Management	Acceptance, acceptability and environmental justice: the role of community benefits in wind energy development
12	Dessi et al. (2022)	Renewable and Sustainable Energy Reviews	Sustainable technology acceptability: Mapping technological, contextual, and social-psychological determinants of EU stakeholders' biofuel acceptance
13	Devine-Wright (2008)	Cambridge University Press	Reconsidering public acceptance of renewable energy technologies: a critical review
14	Edwards et al. (2021)	Sustainable Energy Technologies and Assessments	The status of hydrogen technologies in the UK: A multi-disciplinary review
15	Elzinga et al. (2020)	Journal of Cleaner Production	Consumer acceptance of circular business models
16	Emmerich et al. (2020)	Energy Policy	Public acceptance of emerging energy technologies in context of the German energy transition
17	Eskelinen et al. (2020)	The ISPIM Innovation Conference–Innovating Our Common Future	Circular Economy Business Models Addressing Social Acceptance
18	Fall (2022)	Multimodal Transportation	Analysis of social acceptability in the implementation of a congestion pricing area in Senegal
19	Gordon et al. (2023)	Applied Energy	Socio-technical barriers to domestic hydrogen futures: Repurposing pipelines, policies, and public perceptions
20	Gross (2007)	Energy Policy	Community perspectives of wind energy in Australia: The application of a justice and community fairness framework to increase social acceptance
21	Hee-Cheol (2015)	Journal of Applied Research and Technology	Acceptability engineering: the study of user acceptance of innovative technologies
22	Heiskanen et al. (2008)	CREATE ACCEPTANCE Project, FP6-2004-Energy-3	Factors influencing the societal acceptance of new energy technologies: Meta-analysis of recent European projects
23	Hogan et al. (2022)	Energy Policy	What makes local energy projects acceptable? Probing the connection between ownership structures and community acceptance
24	Horváth and Szabó (2018)	Renewable and Sustainable Energy Reviews	Evolution of photovoltaic business models: Overcoming the main barriers of distributed energy deployment
25	Huijts et al. (2012)	Renewable and Sustainable Energy Reviews	Psychological factors influencing sustainable energy technology acceptance: A review-based comprehensive framework

Appendix A. List of articles included in this review

26	Jan et al. (2020)	Journal of Cleaner Production	Social acceptability of solar photovoltaic system in Pakistan: Key determinants and policy implications
27	Kim et al. (2021)	Renewable and Sustainable Energy Reviews	Is renewable energy acceptable with power grid expansion? A quantitative study of South Korea's renewable energy acceptance
28	Knauf and le Maitre (2023)	Renewable and Sustainable Energy Reviews	A matter of acceptability? Understanding citizen investment schemes in the context of onshore wind farm development
29	Kraly et al. (2022)	Aquaculture	Understanding factors influencing social acceptability: Insights from media portrayal of salmon aquaculture in Atlantic Canada
30	Komendantova and Battaglini (2016)	Energy Research & Social Science	Beyond Decide-Announce-Defend (DAD) and Not-in-My-Backyard (NIMBY) models? Addressing the social and public acceptance of electric transmission lines in Germany
31	Kumar et al. (2022)	Technological Forecasting and Social Change	A framework for assessing social acceptability of industry 4.0 technologies for the development of digital manufacturing
32	Lee et al. (2017)	Energy Economics	Local acceptance and heterogeneous externalities of biorefineries
33	Lennon et al. (2019)	Energy, Sustainability and Society	Community acceptability and the energy transition: a citizens' perspective
34	Lind et al. (2025)	*Nordic Council of Ministers*	Social acceptance as a prerequisite for the green transition
35	Lyu, (2020)	KDI School of Public Policy and Management	A Case Study on Improving Social Acceptance of Renewable Energy
36	Mazzanti et al. (2021)	Waste Management	The biogas dilemma: An analysis on the social approval of large new plants
37	Moula et al. (2013)	International Journal of Sustainable Built Environment	Researching social acceptability of renewable energy technologies in Finland
38	Mok and Hyysalo (2018)	Design Studies	Designing for energy transition through Value Sensitive Design
39	(Syed, 2020)	Faculty of Science and Technology, Universitetet i Stavanger	Understanding the impact of sustainable energy transition on risk acceptability and tolerability
40	Nkundabanyanga et al. (2020)	International Journal of Energy Sector Management	Exploring the link between vulnerability of energy systems and social acceptance of renewable energy in two selected districts of Uganda
41	Pestalozzi et al. (2019)	Energy, Sustainability and Societ	Integrating power-to-gas in the biogas value chain: analysis of stakeholder perception and risk governance requirements
42	Pigeon et al. (2021)	Transportation Research Part F: Psychology and Behaviour	Factors of acceptability, acceptance and usage for non-rail autonomous public transport vehicles: A systematic literature review
43	Piscicelli et al. (2018)	Journal of Cleaner Production	What makes a sustainable business model successful? An empirical comparison of two peer-to-peer goods-sharing platforms
44	Player et al. (2023)	Journal of Environmental Psychology	Quantifying the importance of socio-demographic, travel-related, and psychological predictors of public acceptability of low emission zones
45	Pode (2010)	Renewable and Sustainable Energy Reviews	Solution to enhance the acceptability of solar-powered LED lighting technology
46	Rafiq et al. (2022)	Energies	Corporate Risk Tolerance and Acceptability towards Sustainable Energy Transition
47	Raven et al. (2007)	4th Dubrovnic Conference on Sustainable Development of Energy Water and Environment Systems	Modulating societal acceptance in new energy projects
48	Raven et al. (2009)	Technological Forecasting and Social Change	ESTEEM: Managing societal acceptance in new energy projects
49	Reigstad et al. (2022)	Advances in Applied Energy	Moving toward the low-carbon hydrogen economy: Experiences and key learnings from national case studies

Appendix A. List of articles included in this review

50	Reis et al. (2021)	Renewable and Sustainable Energy Reviews	Business models for energy communities: A review of key issues and trends
51	Rudolph et al., (2018)	Environment and Planning C: Politics and Space	Community benefits from offshore renewables: The relationship between different understandings of impact, community, and benefit
52	Soland et al. (2013)	Energy Policy	Local acceptance of existing biogas plants in Switzerland
53	Stigka et al. (2014)	Renewable and Sustainable Energy Reviews	Social acceptance of renewable energy sources: A review of contingent valuation applications
54	Tu and Yang (2019)	Sustainability	Key Factors Influencing Consumers' Purchase of Electric Vehicles
55	Upham et al. (2015)	Energy Research & Social Science	Towards a cross-paradigmatic framework of the social acceptance of energy systems
56	van der Waal et al. (2020)	Sustainability	Being a Better Neighbor: A Value-Based Perspective on Negotiating Acceptability of Locally-Owned Wind Projects
57	van Wijk et al. (2021)	Energy Research and Social Science	Penny wise or pound foolish? Compensation schemes and the attainment of community acceptance in renewable energy
58	Vlassenroot et al. (2008)	TRAIL Research School, Delft.	Measuring Acceptance and Acceptability of ITS
59	Wang et al. (2018)	Technological Forecasting and Social Change	Analysis of public acceptance of electric vehicles: An empirical study in Shanghai
60	Weitzman et al. (2023)	Environmental Science & Policy	Dimensions of legitimacy and trust in shaping social acceptance of marine aquaculture: An in-depth case study in Nova Scotia, Canada
61	Wüstenhagen et al. (2007)	Energy Policy	Social acceptance of renewable energy innovation: An introduction to the concept
62	Bourdin and Delcayre (2024)	Energy Policy	Does size matter? The effects of biomethane project size on social acceptability
63	García et al. (2016)	Energy Policy	Willingness to accept local wind energy development: Does the compensation mechanism matter?
64	Ek and Persson (2014)	Ecological Economics	Wind farms — Where and how to place them? A choice experiment approach to measure consumer preferences for characteristics of wind farm establishments in Sweden
65	Mariel et al. (2015)	Renewable and Sustainable Energy Reviews	Heterogeneous preferences toward landscape externalities of wind turbines – combining choices and attitudes in a hybrid model
66	Vuichard et al. (2022)	Energy Research & Social Science	Keep it local and bird-friendly: Exploring the social acceptance of wind energy in Switzerland, Estonia, and Ukraine
67	Bush and Hoagland (2016)	Ocean & Coastal Management	Public opinion and the environmental, economic and aesthetic impacts of offshore wind
68	Müller et al. (2023)	Energy Policy	Understanding subjective and situational factors of wind turbine noise annoyance
69	Rand and Hoen (2017)	Energy Research & Social Science	Thirty years of North American wind energy acceptance research: What have we learned?
70	Liu et al. (2021)	Journal of Environmental Planning and Management	Effects of economic compensation on public acceptance of waste-to-energy incineration projects: an attribution theory perspective
71	Lienhoop (2018)	Energy Policy	Acceptance of wind energy and the role of financial and procedural participation: An investigation with focus groups and choice experiments
72	Knauf and Wüstenhagen (2023)	Energy Policy	Crowdsourcing social acceptance: Why, when and how project developers offer citizens to co-invest in wind power
73	Bertsch et al. (2016)	Energy	Public acceptance and preferences related to renewable energy and grid expansion policy: Empirical insights for Germany
74	Knauf (2022)	Energy Policy	Can't buy me acceptance? Financial benefits for wind energy projects in Germany

Appendix A. List of articles included in this review

75	Fast and Mabee (2015)	Energy Policy	Place-making and trust-building: The influence of policy on host community responses to wind farms
76	Liebe and Dobers (2019)	Energy Research & Social Science	Decomposing public support for energy policy: What drives acceptance of and intentions to protest against renewable energy expansion in Germany?
77	Meyerhoff et al. (2010)	Energy Policy	Landscape externalities from onshore wind power
78	Friedl and Reichl (2016)	Energy Policy	Realizing energy infrastructure projects – A qualitative empirical analysis of local practices to address social acceptance
79	Aitken (2010)	Energy Policy	Why we still don't understand the social aspects of wind power: A critique of key assumptions within the literature
80	Eikeland et al. (2023)	Energy Research & Social Science	A wind of change in Norway: Explaining shifts in municipal stances on wind power by policy feedback and energy justice
81	Wolsink (2018)	Energy Research and Social Science	Social acceptance revisited: gaps, questionable trends, and an auspicious perspective
82	de Wildt et al. (2021)	Energy Policy	An ex ante assessment of value conflicts and social acceptance of sustainable heating systems
83	Borch et al. (2020)	Energy Policy	Mapping wind-power controversies on social media: Facebook as a powerful mobilizer of local resistance
84	Dermont et al. (2017)	Energy Policy	Bringing the policy making perspective in: A political science approach to social acceptance
85	Devine-Wright (2009)	Journal of Community & Applied Social Psychology	Rethinking NIMBYism: The role of place attachment and place identity in explaining place-protective action
86	Doedt and Maruyama (2023)	Energy Policy	The mega solar Twitter discourse in Japan: Engaged opponents and silent proponents
87	Duijn et al. (2024)	Energy Research & Social Science	Value-sensitive design under ground? Exploring the community-based monitoring of a geothermal project in the Netherlands
88	Giuliani (2003)	Aldershot: Ashgate	Theory of attachment and place attachment
89	Goedkoop and Devine-Wright (2016)	Energy Research & Social Science	Partnership or placation? The role of trust and justice in the shared ownership of renewable energy projects
90	Haq et al. (2025)	Acta Psychologica	What aspects affect peoples perceptions of energy use? A comparison of heterogeneity versus homogeneity based on an in-depth review
91	Labianca et al. (2024)	Sustainability	A Location Model for the Agro-Biomethane Plants in Supporting the REPowerEU Energy Policy Program
92	Leer Jørgensen et al. (2020)	Energy Policy	Distributive fairness and local acceptance of wind turbines: The role of compensation schemes
93	Lindvall (2023)	Energy Policy	Why municipalities reject wind power: A study on municipal acceptance and rejection of wind power instalments in Sweden
94	Proshansky et al. (1983)	Journal of Environmental Psychology	Place-identity: Physical world socialization of the self
95	Ruef & Ejderyan (2021)	Energy Policy	Rowing, steering or anchoring? Public values for geothermal energy governance
96	Susskind et al. (2022)	Energy Policy	Sources of opposition to renewable energy projects in the United States
97	van der Horst (2007)	Energy Policy	NIMBY or not? Exploring the relevance of location and the politics of voiced opinions in renewable energy siting controversies

Appendix B. Additional evidences for each of the BMfSA antecedents

Reference	Text	Discovered theme of this antecedent	Antecedent
(Mazzanti et al., 2021)	"...even if it is possible to recognize benefits for society as a whole, negative effects on the people living in the surrounding areas are critical" (p.15)	Asymmetry between value created and captured	Goals create value
(Gross, 2007)	"Outcomes that are perceived to be unfair can result in protests, damaged relationships and divided communities, particularly when decisions are made which benefit some sections of the community at the perceived expense of others" (p. 2727)		
(Leer Jørgensen et al., 2020)	"…the belief that financial, environmental, social and health-related burdens were being imposed on local communities while the financial, environmental and energy benefits were enjoyed by the developers, landowners and non-local citizens." (p. 9)		
(Bourdin & Delcayre, 2024)	"…bridge the gap between concerns of residents regarding direct negative impacts and the emphasis placed by public authorities on local benefits." (p. 10)	Need of reducing asymmetry	
(Lennon et al., 2019)	"…novel business models that prioritise the values of community stakeholders equally to those already enjoyed by the energy industry are given greater priority." (p. 4)		
(Devine-Wright, 2008)	"…the key to gaining local community support is to use compensation of a financial or other form to redress imbalances in the distribution of costs and benefits." (p. 8)		
(Friedl & Reichl, 2016)	"Once a person has made his or her mind with respect to an infrastructure project, a change of the opinion will hardly be achieved." (p. 190)	Pragmatic vs dogmatic stakeholders	Mapping stakeholders
(Goedkoop & Devine-Wright, 2016)	"Partnerships are negotiated between developers that express a normative rationale for community engagement and pragmatic community actors that are prepared to accept what developers might offer" (p. 144)		
(Knauf, 2022)	"Proponents and the large group of citizens with rather weak preferences for local wind energy projects appreciate all tested benefits. In contrast, benefits cannot win over the small group of opponents." (p.1)		
(Mazzanti et al., 2021)	"Prior beliefs on the negative impact of the opening of new biogas plants [...] are not reduced by higher biogas knowledge or by participatory processes and informative campaigns" (p. 13)		

(Doedt & Maruyama, 2023)	"A content analysis of 73 Danish Facebook pages of wind energy opponents showed that the online discourse was dominated by opponents who mainly focus on local projects. [...] The silence of project proponents was interpreted as consent by the opponents." (p.3)	Strong or weak preference	
(Knauf & le Maitre, 2023)	"Many papers find a conditional relationship between citizen investment and community acceptance. Walker and Baxter [75] analyzed two provinces in Canada, Nova Scotia and Ontario. The majority of the citizens were in favor of citizen investments, but both proponents and opponents pointed to caveats." (p. 7)		
(Knauf, 2022)	"…(i) citizens who are strongly against wind energy ('opponents'), (ii) citizens who have weak opinions about wind energy ('weak preferences'), and (iii) citizens who are strongly in favor of wind energy ('proponents')" (p. 3)		
(Knauf, 2022)	"Opponents and proponents both state that they have more experience with wind energy than citizens with weak preferences" (p. 5)		
(Lindvall, 2023)	"…rejections are often prompted by the aggressive opposition of the few" (p. 8)		
(Susskind et al., 2022)	"Regulatory agency decisions delayed or blocked renewable energy projects when stakeholders raised concerns that existing environmental rules and regulations were being ignored by project proponents." (p. 8)		
(Devine-Wright, 2009)	"…place attachment significantly explained attitudes to the development, explaining more variance than socio-demographic variables. The more attached residents felt towards the affected area, the more negative beliefs were expressed about the proposal." (p. 432)	Place identity and attachment	Embedded influences (Local, national, and organizational trust factors)
(Meyerhoff et al., 2010)	"…the authors [Bergmann et al. (2006)] find evidence that negative landscape impacts from the development of a project are more acceptable to the rural population." (p. 84)		
(Bourdin & Delcayre, 2024)	"Regions with a history of industrial activity may be more inclined to accept large-scale projects, while rural areas with strong place attachment may resist even modest-sized initiatives (Devine-Wright, 2009; Dobers, 2019). This aligns with the findings of Lyytimäki et al. (2021) regarding the importance of aligning projects with local values and needs." (p. 10)		
(Dessi et al., 2022)	"Residents of industrialized places are more likely to accept 'green' energy facilities. People who are most likely to oppose developments are those who derive a positive sense of identity from rural landscapes especially if they also live there" (p. 3)		
(Devine-Wright, 2008)	"...views are developed in the context of immediate surroundings, and any changes to this are a perceived threat to identity" (p.6)		

(Heiskanen et al., 2008)	"Having good or bad experiences with certain technologies in the past influences the acceptance by stakeholders of new projects. The Norwegian and Dutch development of CCS, for example, was nationally accepted because of the longstanding tradition of co-existence with gas- and oilfields" (p. 81)	Trust	
(Huijts et al., 2012)	"Trust in actors who are responsible for the technology (such as regulators or owners of the technology) have been found to influence citizen's perception of the risks and benefits of the relevant technology" (p. 528)		
(Lennon et al., 2019)	"...acceptance may mostly depend on trust in actors that are responsible for the technology, as a heuristic or alternative ground to base one's opinion on" (p. 4)		
(Friedl & Reichl, 2016)	"Mistrust among stakeholders significantly hampers the progress of negotiations and participatory processes." (p. 190)		
(Wolsink, 2018)	(i) "The crucial turn in 2000 concerning the object of social acceptance, towards institutional change is also missing. Hence, this recognition of institutions as the core object of acceptance research remains underexposed." (p. 287); (ii) "The crucial factor that remains obscured is the existence of path-dependent institutional frameworks that reinforce concrete lock-ins that lead to resistance to innovation." (p. 293)	Institutional frameworks	
(Heiskanen et al., 2008)	"...the effect of national policies on the societal acceptance of projects varied. Sometimes projects were completely initiated or blocked by policy. In other cases, the national policy only influenced some stakeholders of the project." (p. 77)		
(Dermont et al., 2017)	"…distinct process of social acceptance and thus actors' responses that are 'activated' depend on specific elements of policymaking such as actors' roles (e.g., decision-maker; target; sovereign), timing (e.g., proposal; final decision at the ballot), or the institutional room of manoeuver given to the actors (e.g., direct democracy; lobbying)" (p.367)		
(Friedl & Reichl, 2016)	Regarding the Upper Austrian situation, the active resistance against high voltage lines and wind power project becomes apparent in different forms and manifestations. Based on our analysis, we find that opposite positions act in different ways with different aggregation levels, from single residents, local initiatives with residents, citizens, local association to inter-communal groups and associations. […] Furthermore, the engagement of the municipalities and the local politicians is another crucial point when it comes to the question about approving such project plans in the respective regions and municipalities." (p. 1987)		
(Müller et al., 2023)	"Mitigation measures at wind farms should prioritise these circumstances, e.g., by reducing rotational speed during the night and specific meteorological conditions like high humidity, or frost" (p.9)	Limiting tactic: Designing to minimize the perceived negative externalities by local stakeholders	Tactics
(Lennon et al., 2019)	"Public opposition is seen as a significant threat to realizing... [the] renewable energy deployment. The most commonly cited motivations [is]... an inappropriate scale of development" (p. 3)		

(Kim et al., 2021)	"…their acceptance dropped remarkably when power plants were located near their residential areas. Furthermore, when the plants were moved approximately 5 km away from their residential areas, the acceptance rate reached 80%" (p. 3)		
(Soland et al., 2013)	"…planners should concentrate in the first place on efforts to prevent emissions of unpleasant smells" (p. 808)		
(Vuichard et al., 2022)	"…mitigating negative impacts on landscape and on the flora and fauna play an important role in achieving high levels of social acceptance at the local level" (p. 8)		
(Liu et al., 2021)	"…economic compensation is able to ease local residents' perceived economic benefit effectively and thus significantly improve public acceptance" (p. 1519)	Compensating tactic: Offering compensation to decrease percieved negative impacts of the project	
(Kim et al., 2021)	"…previous studies of the local-based renewable energy have shown that local acceptance of renewable energy projects can be positively improved by introducing the benefit sharing structure with the community" (p. 4)		
(Lienhoop, 2018)	« Residents request compensation in terms of a decrease in electricity bill if the operator is regional rather than local" (p. 102)		
(García et al., 2016)	"We found that local residents would trade lower levels of private compensation for higher levels of provision of a local public sports facility" (p. 172)		
(Rand & Hoen, 2017)	"Community compensation may take the form of payments, energy efficiency retrofits, […] or offsetting electricity costs" (p. 140)		
(Lyu, 2020)	"…social value creation such as [...] preferential hiring of local manpower is considered to be appropriate" (p. 46)	Enhancing tactic: increasing percieved positive externalities by using the project to respond to values that would be unmet otherwise	
(van Wijk et al., 2021)	"…the creation of employment opportunities involving local businesses and the regional supply chain" (p. 2)		
(Rand & Hoen, 2017)	"Local ownership or investment enables more equitable distribution of financial benefits and more participation in the development process" (p. 140)		
(Lennon et al., 2019)	"…community members said they supported a smaller project that had initially been proposed by a local group for the same site, especially if control for the project rested with the community" (p. 4)		
(Knauf, 2022)	"…ownership has a positive effect on community acceptance" and it causes "a strong will and support in the local community and municipality to build wind farms" (p. 6)		
(Pode, 2010)	"One method to redress adoption issues is "Link installation of PV systems with poverty alleviation projects" (p. 1100)	Coupling tactic	

(Lyu, 2020)	« Some examples of values to provide are "apprenticeship and studentship, education programmes etc." (p. 13)		
(Rand & Hoen, 2017)	"Investments in parks or community centers" (p. 140)		

Appendix C. Additional evidences for each of the phases for designing a BMfSA

Reference	Text	Discovered themes on the process	Phases
(Emmerich et al., 2020)	"Benefits, risks and costs that are salient and perceived can influence attitudes towards a technology directly" (p. 3)	Perceptions matters for SA	Value Sensing
(Nkundabanyanga et al., 2020)	"...when individuals perceive that renewable energy technologies can be trusted in terms of their safety and security, this can enhance their proclivity" (p. 1094)		
(Stigka et al., 2014)	"...research literature lists a wide variety of potential barriers [to a renewable energy sources projects] that relate to how the public perceives RES projects, and how it is impacted by them." (p. 103)		
(Raven et al., 2007)	"…while new energy technologies may be attractive for a variety of reasons from a collective perspective […] local projects have to deal with local interests as well" (p. 2)	Need to sense values of a broad range of stakeholders	
(Duijn et al., 2024)	"Including a wider variety of actors in policy and decision-making processes calls for the subsequent inclusion of a broader array of values that these actors hold in their orientation on geo-energy technologies." (p. 4)		
(Ruef & Ejderyan, 2021)	"Opening up the energy transition to a wider group of actors, including citizens and civil society organizations" (p.1)		
(Haq et al., 2025)	"Socioeconomic variables, including energy education, cultural norms, and financial considerations, are shown to impact these perceptions." (p.1)		
(Haq et al., 2025)	"…family income positively influences the association between attitude towards purchasing energy-efficient and renewable energy (EERE) equipment and behavioral intention. The financial condition of a family affects the acquisition of eco-friendly and renewable energy equipment, with subsidy incentives favorably influencing family income." (p.7)		
(Gross, 2007)	"The extent to which these principles [the ability to express opinions freely and to be heard (voice)] are used, influences participants' views on the fairness of the decision-making process" (p. 2730)	Managing value sensing	

(van der Waal et al., 2020)	(i) "During the design process of a wind project, different stakeholders can have a different understanding of what a value means" (p. 4); (ii) "Value conflicts between the stakeholders involved in local wind energy projects should not only be perceived as negative. Certainly, value conflicts require deliberation and can slow down or even stop projects that can contribute to sustainability" (p. 15)		
(de Wildt et al., 2021)	"Although addressing value conflicts might not allow us to exactly predict future acceptance (which is challenging in the case of sustainable heating systems in any approach), it can help to identify potential risks and understand when these risks can become problematic." (p. 3)		
(Pestalozzi et al., 2019)	"Several expert stakeholders from industry, science, and associations argued that people have a negative stand against the BGS because they do not have enough and adequate information about the technology and the overall sector" (p. 9)	Communication shaping stakeholders' perception SA	Value communicating
(Bourcet, 2020)	"…communication to all stakeholders, including people living in areas where RE sites are located, is key to support local acceptance" (p. 31)		
(Rafiq et al., 2022)	"The way of adoption and implementation of these technologies should be communicated for better acceptance of these technologies and successful implications." (p. 5)		
(Lennon et al., 2019)	"…by simply providing appropriate amounts of information, citizens will respond accordingly, switching away from negative behaviours and engaging in more ecologically sustainable practices." (p.2)		
(Jan et al., 2020)	"If the benefits, particularly environmental benefits, of solar PV system are communicated to the consumers, the households having high environmental value will quickly adopt solar PV system" (p. 8)	Transparency on negative impacts & emphasis on positive values	
(Fall, 2022)	"...offer an effective communication of the expected benefits attributable to road pricing and to make known to society, in a transparent and precise way, the destination of the funds collected; aspects that have a very prominent impact on the social acceptability..." (p.1)		

(Horváth & Szabó, 2018)	"... market actors should take on an active role in the dissemination of information and the education of consumers. The widespread availability of information may result in higher awareness and acceptance." (p. 626)	Market and expert actors leading communication	
(Dessi et al., 2022)	"...expert stakeholders, acting as educational advisors in information campaigns to end users can serve as gatekeepers thereby facilitating biofuel acceptance" (p. 14)		
(Pode, 2010)	"Increase understanding of solar PV technology to the large community via TV/radio programs, personal networks [can combat barriers to adoption of solar PV]" (p. 1100)	Effective communication methods	
(Syed, 2020)	"...we have to check the conditions on which people are willing to adopt renewable energy source. Meanwhile we have to educate the individuals to make their understanding better" (p. 3)		
(Vlassenroot et al., 2008)	"The acceptance will [...] depend on how user needs are integrated in the development of the system" (p. 2)	Integrating stakeholders in value reconfiguration	Value reconfiguring
(van der Waal et al., 2020)	"...projects can be made more sensitive to the values of local stakeholders by integrating these in project design" (p. 14)		
(Knauf & Wüstenhagen, 2023)	"…the local council gave a great deal of support to the project, through collaborative planning, consultation and engagement of an interested panel of local citizens" (p. 6)		
(Dessi et al., 2022)	"In order to ensure the implementation of sustainable technologies, it is important that decisions are made in a collaborative manner and not through hierarchical procedures" (p. 2)		
(Lennon et al., 2019)	"We found that participants want to see meaningful change and a transition to a low-carbon RES system where they actually have real agency" (p. 5)		
(Raven et al., 2007)	"...societal acceptance of a local project has been modulated when […] expectations become […] translated into a shared vision" (p. 3)	Aligning and negotiating expectations for a shared vision	

(Raven et al., 2007)	(i) "...when project manager is not able to align his or her expectation with the expectations of different stakeholders, societal acceptance did not emerge"; (ii) "following the articulation of expectations and specifically the way they are negotiated is a strategy to research the societal acceptance of new energy project" (p. 3)		
(Lyu, 2020)	"...reducing the likelihood that community interests will be considered bribes [is an issue related to renewable energy development]" (p. 11)	Mediation and negotiation management	
(van der Waal et al., 2020)	"In a participative planning context such as a sounding board, the help of a neutral mediator, or even supportive intermediaries, can help" (p. 15)		
(Raven et al., 2007)	"...the Create Acceptance consultant and the project manager enter into a dialogue to discuss possibilities for changing the project in order to address the conflicts identified or exploit opportunities." (p.11)		