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THE POTENTIAL ROLE OF SMALL INTERMEDIARIES IN ACCELERATING SUSTAINABLE ENERGY CHOICES: A SERVICE DESIGN STUDY OF SMARTBILLY

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Abstract

This study examines how digital energy intermediaries like SmartBilly can support consumers' adoption of green energy through service design, revealing that their potential role extends beyond price comparison. Based on a four-month internship within the company and qualitative research involving interviews with Italian households and SMEs, the study identifies diverse motivations for sustainable choices and shows how transparent communication and business model factors shape willingness to engage with greener options. The findings highlight that intermediaries can become connectors among consumers, energy providers, and policymakers, thereby supporting coordinated change in the energy ecosystem. Implications for practice and future research are discussed.

Keywords: sustainable energy transition, service design, green energy adoption, digital intermediaries, ecosystem connector role.

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Introduction

The transition to a more sustainable energy system represents one of the most critical global and European challenges of the coming decades. As the European Union advances its decarbonization agenda, the achievement of climate targets increasingly depends not only on large-scale technological innovation but also on the active engagement of citizens, households, and small businesses. In this context, the diffusion of renewable energy solutions and the success of sustainability policies are strongly influenced by the everyday choices of end-users. However, these choices are not made in isolation: they are shaped by the market actors that mediate access to energy offers. Among these, digital energy intermediaries have gained relevance in recent years, simplifying contract selection processes and guiding consumers through complex and often opaque tariff systems. SmartBilly, an Italian digital intermediary, operates within this emerging landscape.

Despite a clear policy push toward renewable energy adoption, the communication and business models of many intermediaries remain predominantly centered on cost minimization. While price is undeniably a central factor in consumer decisions, this focus may overlook segments of the population who show interest in greener energy options and could be supported in making more sustainable choices. This misalignment raises questions about the potential of intermediaries to move beyond a purely transactional role and instead contribute more directly to the advancement of the green transition. Against this backdrop, this research investigates how a digital energy intermediary like SmartBilly could enable consumers' adoption of green energy through the design of new services. The study is consequently guided by the following research question:

"How can a digital energy intermediary like SmartBilly enable consumers' adoption of green energy through the design of new services?"

Practically, the research addresses SmartBilly’s interest in assessing the feasibility of introducing a sustainability-oriented service offering within the Italian market. At the start of the internship on which this thesis builds, the initial objective was to carry out a UX-focused exploration of how households interacted with the company’s services. As the work progressed, however, the inquiry gradually shifted toward an investigation of consumers’ perceptions of sustainable energy and of the potential role that digital intermediaries may play in supporting the energy transition. Throughout four months of direct involvement in the company, participating in meetings, client interactions, and internal discussions, it became evident that SmartBilly operates in a competitive environment marked by limited resources and by a renewable-energy market that is expanding yet still fragmented. In this context, understanding how end-users approach green energy, what drives their decisions, and how intermediaries could assist them is essential for informing the company’s strategic considerations.

From a theoretical perspective, the study contributes to the discussions around the role of intermediaries in the energy ecosystem, highlighting how service design approaches can support the design of user-centered, sustainability-oriented services and potentially reposition intermediaries as facilitators of collective change.

The thesis proceeds by first outlining the relevant literature on energy regulations, consumer behavior, and digital intermediaries, followed by the methodological approach combining survey research, qualitative interviews, and direct experiential observation. The findings are then presented through the identification of user personas, the analysis of willingness to pay and motivations, and the exploration of SmartBilly's potential strategic evolution. The discussion and conclusions summarize the key findings and recommendations while acknowledging some limitations.

1. Literature review

1.1 Green energy Regulations and Trends

The transition to renewable energy sources has become one of the crucial challenges of contemporary economic and environmental policy, as the governments try to align energy security, competitiveness and climate objectives. Within this global effort, the European Union positioned itself as a frontrunner, with all the member states legally committed to fighting climate change. In December 2019, all the member states agreed to shift to a climate-neutral economy with net-zero greenhouse gas emissions by 2050 (European Commission 2020). Accordingly, the European Commission launched the European Green Deal which includes a series of initiatives that cover energy, transport, agriculture, industry and finance. The Green Deal connects the 2019 net-zero goal to the 2015 Paris Agreement, a legally bounding international treaty on climate change (European Commission 2019). The net-zero concept means that the greenhouse gas emissions generated by human activity must be heavily reduced or compensated by carbon removals, reaching an economy where the net emissions balance is equal to zero. To this end, boosting renewable energies represents a key measure. Furthermore, energy production and consumption account for 75% of total EU greenhouse gas emissions (Council of the European Union 2024). This makes the energy sector the largest source of emissions and the most crucial area for intervention. To translate objectives in actions, the EU proposed in 2021 "Fit for 55". It includes a set of directives and reforms with the aim of reducing emissions by at least 55% by 2030, compared to 1990 levels (Council of the European Union 2023). The package of laws is continuously updated. For example, an amendment introduced in November 2025 set a new target: a 90% reduction in net greenhouse gas emissions by 2040 compared to 1990 levels (Council of the European Union 2025).

When it comes to regulations, the key legal framework for renewable energy sources in the European Union is the Renewable Energy Directive (RED). This directive sets binding targets for the share of energy consumption that must come from renewable sources across the EU. The first version, RED I (2009), established a target of 20% by 2020. It was followed by RED II (2018), which increased the goal to 32% by 2030. The most recent update, RED III (2023), further raised the ambition to 42.5% by 2030, with an additional indicative top-up of 2.5%, aiming for a potential overall target of 45% (European Commission 2023). In this context, investing in renewables and cleaner forms of energy becomes crucial not only to achieve the targets but also to strengthen the Union's energy independence, a priority further emphasized by the geopolitical situation following Russia's invasion of Ukraine.

At the national level, each Member State is responsible for translating the European framework into concrete policies and measures (Taromboli et al. 2025). Italy's policy framework for renewable energy development is mainly defined by the Integrated National Energy and Climate Plan (PNIEC). The Plan addresses the goals that each Member State commits to achieving by 2030 across five key dimensions: (1) decarbonization, including greenhouse gas emissions and renewable energy; (2) energy efficiency; (3) energy security, covering supply diversification and system flexibility; (4) the internal energy market, addressing transmission infrastructure and market integration; and (5) research, innovation and competitiveness (Ministero dell'Ambiente e della Sicurezza Energetica 2023).

Despite the ambitious objectives outlined in the PNIEC, Italy is still falling behind in meeting its 2030 climate and energy targets. Recent assessments (ECCO 2024) reveal substantial delays in the implementation of renewable energy projects, with only about 25% of the planned new renewable capacity installed so far and a remaining gap of nearly 100 million tons of CO_2 emissions compared to the planned reduction trajectory. The same assessments identify as key obstacles the slow implementation of renewable projects, a persistent fiscal bias favoring fossil fuels, and the absence of a clear financial strategy distinguishing public and private investments. However, as Sangroya and Nayak (2017) point out, for complete acceptance of green energy, relying solely on government regulations is not enough; the willingness to use green energy and contribute to the wellbeing of the environment should spring from within consumers. Similarly, Bigerna and Polinori (2014) highlight that policymakers play a crucial role not only in designing regulatory frameworks but also in promoting education and information campaigns. These initiatives can strengthen market sustainability by increasing public awareness of renewable energy and encouraging more informed consumption choices. Their argument underscores a broader point: the willingness to pay for green energy depends strongly on consumers' understanding of its benefits. Therefore, policies that provide clearer information, build trust, and frame the value of renewable energy more effectively are essential to stimulate private demand and to reduce the gap between policy ambitions and actual outcomes. This idea is also reinforced by Hojnik et al. (2021), who find that consumers' willingness to pay (WTP) for green electricity is strongly influenced by their knowledge of green energy and by a combination of behavioral and normative factors.

1.2 Digital Intermediaries in the Italian Energy Industry

The Italian energy market has undergone a progressive liberalization process over the past two decades, moving from a state-controlled monopoly to a competitive environment in which consumers can freely choose their electricity and gas suppliers. The process is still ongoing: at 2024 78.6% of the clients operate in the free market, while the remaining 21.4% are either vulnerable consumers still served under the regulated regime or non-vulnerable households temporarily included in the *Servizio a Tutele Graduali per i domestici Non Vulnerabili* (STGNV), a transitional mechanism designed for clients who have not yet selected an offer from the free market (ARERA 2024).

In this setting, to simplify access to information, enhance market transparency, and reduce the complexity of supplier selection, a growing number of digital intermediaries emerged. These platforms play a key role in facilitating consumer participation in the energy market, helping households and businesses navigate an increasingly fragmented landscape of offers. From an economic perspective, digital intermediaries should contribute to greater market efficiency by reducing information asymmetries and transaction costs.

Today, their business models and value propositions remain almost entirely cost-driven, as they compete and attract customers only on prices, and promote offers that maximize perceived economic savings rather than environmental value or green offerings. This creates a misalignment between the European and Italian policies, aiming towards net-zero, and the intermediaries that operate prioritizing affordability and savings. Furthermore, it represents a relevant case to explore how digital intermediaries like SmartBilly can sustain their competitiveness in a price-sensitive market while contributing to broader sustainability objectives through new value propositions.

1.3 A service design lens

Service Design, a design-inspired approach to business innovation that emerged more than two decades ago, refers to a process that requires a disciplined yet creative approach to identify and execute the most promising ideas within a company (Jones and Samalionis 2008). It focuses on designing systems and processes around the delivery of value through a service to the user (Bedford and Lee 2008), aiming to create services that are useful, useable, desirable, efficient, and effective in a systematic and iterative way (Løvlie et al. 2008).

An essential aspect of service design for SmartBilly's context, especially as it explores sustainability-oriented innovation, is the active involvement of clients throughout the design process. This principle is significant when designing services, since the clients in question are inherently involved in both its production and delivery (Saco and Goncalves 2008). Their perception therefore becomes central in the service equation: involving them in the process from the early stages is fundamental to build trust, shape positive experiences and ensure that innovation is perceived as valuable. This perspective directly guided the methodology choice of the present research, with the goal and request from the founders of looking for opportunities to influence positive perceptions when actually implementing the new green service (Bedford and Lee 2008).

Moreover, service design provides tools to tackle the barriers to innovation directly, particularly the tendency to focus on incremental rather than radical change. As Jones and Samalionis (2008) write, the service design process starts from developing insights about the market, which can come from many areas as this research's methodology experienced, and leads to the creation of radical value propositions and creative service models, allowing to fail and iteratively pilot to refine the new services. This was particularly pertinent in SmartBilly's case, as the new value proposition would represent a radical shift from the traditional cost-centered logic of the energy intermediaries toward a more sustainable and green-oriented service model.

Thanks to the direct involvement in SmartBilly's operations, the study examines how the misalignment between policy ambitions, intermediaries' cost-driven logic, and users' diverse motivations plays out in real decision-making. Through the service design lens, the research seeks to empirically explore how these dynamics unfold in practice. Thus, SmartBilly's case serves as an example of how digital intermediaries can evolve to support the broader sustainability agenda and contribute to achieving ambitious climate goals.

2. Research Setting and Methodology

2.1 Research Setting and the Context of the Direct Research Internship

SmartBilly is a digital intermediary actively operating from 2022 in the Italian energy market with a primarily cost-oriented focus, although with an ambition to explore how to evolve its value proposition. Its current service model is captured by the promise "You delegate once and save forever": clients outsource the management of their utility contracts to SmartBilly, which continuously monitors the market for more advantageous offers and automatically switches providers whenever a cheaper tariff becomes available. This ensures that users always have the most competitive prices. SmartBilly's revenue model is then based on a performance-sharing mechanism in which the company retains half of the savings generated by each switch, calculated by comparing the previous and the new contracts under equivalent consumption conditions.

On the company side, the four-month immersion within SmartBilly offered a clear understanding of the company's internal constraints, priorities, and decision-making dynamics. Participating in daily meetings, informal discussions, and ongoing exchanges with the founders revealed the challenges and constraints typical of early-stage startups, such as resource scarcity, survival-oriented choices, and the difficulty of experimenting beyond the cost-saving model. On the clients' side, direct interaction with customers offered an equally valuable perspective. Conducting face-to-face visits, leading client meetings, and observing their reactions in real settings made it possible to grasp the diversity of motivations, concerns, and expectations that individuals and small businesses hold toward the energy market and green solutions.

Finally, the initial aim of the internship was to explore consumer reactions to different green energy solutions from a UX perspective. However, as the research progressed, through literature review, customer interactions, and internal exposure, it became evident that the potential value of SmartBilly, and similar intermediaries, extends far beyond optimizing costs. The findings revealed an opportunity for these actors to evolve into ecosystem connectors, helping align the informational and motivational needs of the various players in the energy sector. This realization shaped the final direction of the research, linking SmartBilly's current operations with its broader strategic potential in supporting sustainable energy transitions.

2.2 Methodology: Data Collection

This study adopts a user-centered Service Design approach as its methodological stance, with the goal of understanding users' perceptions, motivations, and barriers related to green energy choices and the service design of digital energy intermediaries. The process involved a two-steps approach: first, a survey to empirically capture trends, preferences and willingness to pay for green energy. Second, a round of qualitative interviews to elicit richer, more actionable insights and to understand the real motivations behind the respondents' survey results.

Before developing the survey and the interviews script, an exploratory discussion with SmartBilly's founders played a key role in shaping the research direction. This initial brainstorming session helped outline several potential service or value-proposition scenarios that SmartBilly could consider, each envisioning different ways in which the company might incorporate sustainability into its offering. These preliminary scenarios, summarized in Appendix 1, served as a conceptual frame for defining the questions asked to users.

Among the various options, the company identified one scenario as the most feasible: an opt-in service in which customers can activate a "100% Green" mode either during onboarding or within their SmartBilly account. Once activated, SmartBilly would automatically switch users only to the cheapest provider among the ones offering certified green energy. However, the founders emphasized that such a model would require a small additional monthly fee, given that restricting the pool of eligible providers increases operational complexity and monitoring efforts. This scenario therefore became the focal concept explored both in the survey and in the interviews.

2.2.1 Survey

The survey structure began with an initial section applicable to every respondent; this section included demographic questions, inquiries about interest in renewable energy and willingness to pay for it, as well as a question exploring the main motivations behind each respondent's level of interest in green energy. Furthermore, this first section had a question to divide the respondents into 4 categories: (1) SmartBilly household customers (2) SmartBilly business customers (3) Non-SmartBilly household respondents (4) Non-SmartBilly business respondents. This distinction was necessary to explain SmartBilly's role as an intermediary to participants who were not already customers, and then to differentiate households and businesses to include questions about the potential strategic value of green offerings for the latter.

Consequently, the questions of the following sections can be summarized in two main categories, i.e. households and businesses since the SmartBilly/Non-SmartBilly division was only functional to contextualization. For the household segment, the survey explored the perceived relevance of a potential SmartBilly filter allowing users to activate only offers from 100% renewable energy providers, their willingness to pay SmartBilly (as the intermediary) to enable this feature, and the additional services they would expect if activating it, such as sustainability reports or green certificates. For businesses, the same set of questions was proposed, with an additional one assessing the level of interest in receiving a certificate to display in their premises as part of the service's added value. The complete list of survey questions for all four respondent categories can be found in Appendix 2.

The survey was then reviewed and approved by SmartBilly's founders, who provided a contact list of clients to whom it could be directly distributed via email. This selective distribution method aligned with one of SmartBilly's core values, i.e. avoiding unnecessary communication in a market already saturated with information and affected by deceptive practices. Therefore, an initial round of 30 responses was collected from the founders' friends and family to test the survey and ensure consistency with the company's communication principles. To increase participation without generating unsolicited contact, a second distribution strategy was adopted: the survey link was included at the end of the regular email notifications that SmartBilly's customers receive whenever a new electricity or gas bill is issued. This approach proved effective and led to a final total of 55 valid responses.

2.2.2 Interviews

The structure of the interviews, which can be found in Appendix 3, was organized in seven sections, following a flexible and conversational structure:

- Introduction – Participants were informed about the purpose of the interview and its anonymity; the aim was to create a relaxed environment encouraging an open discussion.
- Questionnaire Verification – The same initial questions of the survey on interest for renewables and willingness to pay for them were repeated, to confirm the previous answers and to maintain consistency between quantitative and qualitative data sets.
- Perception of green energy – This section explored participants mind associations and opinions on sustainability and renewable energy, understanding whether the topic felt close to their daily routines and, for business participants, whether using green energy could influence customer perceptions.
- Expected value and guarantees – Here participants were asked what additional features they would expect from SmartBilly and why, to furtherly discuss on how an intermediary should design its new service. For business clients, an additional question addressed the potential value of having a visible certificate to communicate their green commitment.
- Motivations and barriers – This part aimed at uncovering the reasons for and against choosing green energy. This helped in highlighting what stops or inspires them, exploring drivers such as environmental impact, skepticism, and greenwashing, and in general to associate a qualitative metric to the quantitative ones gathered with the survey.
- SmartBilly scenarios – Interviewees were presented with the hypothetical scenario in which SmartBilly would exclusively offer 100% green energy plans, but with a monthly fee. This service-design-oriented question helped assess the potential market acceptance of such a strategic move and users' willingness to pay for intermediaries' services.

- Closing – Participants were invited to share any additional thoughts or comments on the topic that had not been covered, followed by a final thank-you for their contribution.

To recruit SmartBilly clients willing to contribute to this qualitative phase, an optional question was added at the end of the survey, inviting respondents to leave their email address if interested in being contacted for a follow-up discussion. Through the help of this method, a total of 10 qualitative interviews were conducted.

Finally, the survey and interviews were complemented by the aforementioned four months of hands-on experience inside SmartBilly, which provided direct exposure to the company's operational constraints, daily challenges, and client interactions. This insider perspective enriched the interpretation of both quantitative and qualitative data, offering contextual depth that would not have emerged through participants' responses alone.

2.3 Methodology: Data Analysis

2.3.1 Survey Analysis

The first step to understand respondents' attitudes toward renewable energy and their willingness to engage with digital intermediaries such as SmartBilly consisted in a round of quantitative analysis. The final survey sample of 55 respondents divided as follows: 40 SmartBilly household customers, 3 SmartBilly business customers, 9 non-SmartBilly household respondents and 3 non-SmartBilly business respondents. The survey was not further extended to additional non-SmartBilly users, since a preliminary analysis showed that 100% of them answered "no" to the question asking whether they knew or used digital intermediaries in the energy provider selection process. As a result, the focus was redirected toward increasing the number of existing SmartBilly customers in the dataset, always considering SmartBilly's communication policy constraints.

The survey data were first examined to map general patterns in attitudes toward renewable energy and in willingness to pay for both green energy and SmartBilly's potential service features. The analysis focused on identifying how different levels of environmental interest related to different economic choices. Specifically, it focused on the price premiums that the respondents were willing to pay for green energy and the monthly fee they considered reasonable for SmartBilly's service. In addition, the survey explored the motivations behind respondents' interest in renewable energy. To capture the variety of possible drivers, participants were allowed to select multiple reasons, enabling a first categorization of the factors influencing their choices. This step was useful to outline broad trends and to detect initial patterns that could later guide the qualitative phase. The main supporting visualizations used in this analysis can be found in Appendix 4.

Beyond these descriptive patterns, the analysis also compared responses across different questions to identify potential inconsistencies or tensions; for example, differences between general motivations for choosing green energy and motivations expressed when imagining SmartBilly's service. These comparisons highlighted the need for deeper analyses than survey data, to fully capture the reasoning behind participants' choices, especially when economic and environmental considerations intersected. For this reason, the survey was intentionally paired with a second qualitative step: the customers' interviews. The survey offered a clear, quantitative overview of behaviors and preferences, while the subsequent interviews were designed to deepen the understanding of the meanings, internal logics, and nuances that a questionnaire cannot capture. This two-step process represents also an important methodological learning of the study: in service design research, quantitative tools are effective for mapping patterns, but human-centered qualitative inquiry is essential to uncover why users think and decide as they do.

2.3.2 Interviews Analysis

To best analyze the qualitative data collected through the ten semi-structured interviews, a thematic analysis (Spradley 1979) was conducted following a structured and iterative approach. The complete thematic coding table can be found in Appendix 5. The process began with the transcription and full redaction of each interview, ensuring that no relevant insight or nuance was lost. Once all interviews were transcribed, they were re-read several times to gain familiarity with the data and to identify passages that were particularly meaningful in relation to the research question and to the motivations, perceptions, and decision-making drivers behind consumers' energy choices. In the next phase, each of these relevant quotes was assigned a code, that is, a concise label capturing a concept, attitude, or behavioral pattern emerging from the data. This open coding phase generated a large set of preliminary codes, which were then reviewed and grouped into broader subthemes whenever they referred to similar or connected ideas. Through an iterative comparison and refinement process, these subthemes were further consolidated into 3 overarching themes:

- Different motivations and personas' approach to green energy through intermediaries.
- Unclear cost ownership and greenwashing prevention.
- A new opportunity for digital intermediaries in today's energy industry ecosystem.

These three main themes later structured the presentation of the study's key learnings and recommendations.

Before moving to that discussion, it is still relevant as a concluding element of the data analysis, to highlight how the quotes, codes and subthemes from the first theme helped create three personas. Personas are a design thinking tool, where the insights collected are synthetized into actionable representations of users (Dam and Teo 2025). In service design, personas are fictional yet research-based characters, that represent distinct user types who interact with a product, service, or brand in comparable ways. They help designers and decision-makers better understand users' needs, experiences, behaviors, and goals (Nielsen 2014). In this case, the personas could already be identified from the survey, but their underlying motivations, daily tensions and sustainable actions, emerged instead from the thematic interviews.

This process not only highlighted the diversity of attitudes and willingness to pay among users but also revealed underlying tensions, expectations, and behavioral patterns that go beyond cost considerations, and that an intermediary like SmartBilly must consider while designing its new service. These insights form the foundation for the next section, which presents the three key learnings of this study each exploring a distinct dimension emerging from the data: users' motivations and personas, the tension around who bears the cost of sustainability, and the potential evolving role of digital intermediaries like SmartBilly in the European green transition.

3. Key Learnings and Recommendations

3.1 Beyond cost: different motivations and personas

Analyzing SmartBilly's customers, the actual nature and motivations guiding their choices emerged. Although the company has so far framed its user base as primarily cost-oriented, the empirical evidence shows a more complex set of attitudes and values. Even respondents who initially engage with SmartBilly for financial reasons also express environmental concerns, expectations of responsibility, and interest in contributing to sustainable practices.

By combining insights from the survey (Figure 1) and the thematic interviews, three main personas were identified, each representing a distinct user profile with specific motivations, barriers, and expectations toward green energy adoption:

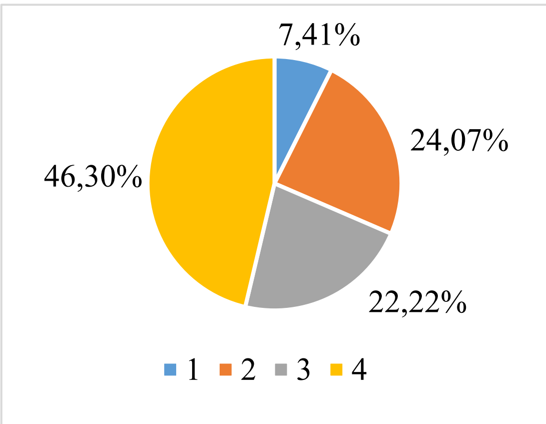

Figure 1: Green Energy Interest on a Likert Scale 1-4 | Source: Author's survey

1. *The Pragmatic Saver* – 1 out of 4 in interest level for green energy in the survey.

- **Motivations**: The *Pragmatic Saver* is primarily motivated by financial convenience. Their relationship with energy providers, and with SmartBilly, is exclusively cost-driven: they engage with the platform to obtain savings and will remain only as long as those savings are maintained. Sustainability does not play a role in their decision-making, as they prioritize economic efficiency above all else.
- **Barriers**: Their main barrier is a strong sense of disengagement from environmental issues. They consider individual actions irrelevant and openly acknowledge a lack of information or interest in becoming informed. They express skepticism toward the real impact and scalability of renewable energy, often perceiving sustainability as unnecessary or media-constructed. Thus, their willingness to pay for green energy, or for any additional service provided by a digital intermediary, is consistently zero.
- **Expectations**: They expect energy offers to be cheap, simple, and effort-free. Any additional feature that does not translate directly into economic benefit is perceived as unnecessary. For this persona, green energy adoption will only occur if it aligns with, or improves, their financial savings.

2. *The Aware-but-Hesitant* – 2 or 3 out of 4 in interest level for green energy in the survey.

- **Motivations**: The *Aware-but-Hesitant* persona values environmental responsibility but negotiates it with financial prudence. They are willing to engage with green energy if the cost increase is controllable (on average up to 2% more) and if the benefits are clearly demonstrated. Their motivations also stem from a desire to behave fairly and responsibly, as shown by their engagement in small, low-effort sustainable habits (e.g. waste sorting). They appreciate the idea of contributing to innovation and to the sustainable transition, provided that this contribution remains economically manageable.

- **Barriers**: Their barrier lies in the perceived mismatch between expectations and reality. Many believe that renewable energy "should cost less because it comes from nature," and when prices do not reflect this expectation, it generates mistrust or disappointment. This reveals an ambivalent stance: they care about the environment but remain strongly anchored to financial caution. Limited clarity, insufficient communication, or offers perceived as unfair can easily hinder their willingness to adopt green solutions.
- **Expectations**: They expect transparency, fairness, and accessible explanations of benefits. Green solutions must be framed as credible, convenient, and trustworthy. While not opposed to paying a small premium, also to intermediaries, they require clear communication and evidence of tangible value, both environmental and economic.

3. *The Conscious Changer* – 4 out of 4 in interest level for green energy in the survey.

- **Motivations**: The *Conscious Changer* is driven by strong ethical and environmental values and sees sustainability as part of their identity. They actively seek to support innovation, decarbonization, and future-oriented energy transitions. Their willingness to pay is the highest among all personas: up to 5% more on their energy bill, driven by a mix of functional motivations (supporting systemic change) and emotional motivations (peace of mind, contributing to future generations, setting a positive example).
- **Barriers**: Their main barrier is not financial but relational. They require high levels of trust, transparency, and proof of impact. Any sign of greenwashing or inconsistency can quickly undermine their engagement. They expect authenticity from companies and need reassurance that their contribution is meaningful and effectively used.
- **Expectations**: They expect green energy to be a catalyst for broader societal change. They view SmartBilly as a potential enabler capable of amplifying individual actions and connecting them to collective outcomes. They seek simple and clear services that

provide visibility on impact, foster community engagement, and demonstrate how citizen-led choices can influence institutions and accelerate the transition at a systemic level.

Accordingly, to begin designing a service that accelerates the adoption of green energy, acknowledging the heterogeneity within SmartBilly's customer base is essential. The three personas presented represent a first segmentation that already provides valuable insights into diverse motivations and behaviors. Consequently, the first key to learning emerging from this research is the presence of a motivated customer segment that is willing not only to use green energy services but also to pay for them, although to varying extents. From the company perspective, the discussion of these findings with the founders revealed an unexpected level of interest: they were notably surprised to learn that a significant portion of their users demonstrates a genuine willingness to engage with sustainability within the SmartBilly platform. This represents their first exploration of customer motivations beyond purely cost-driven considerations, and it shows that consumer decision-making can be guided by sustainability-oriented logics rather than exclusively by price sensitivity.

These results provide an initial indication that SmartBilly could leverage such motivations to develop a differentiated value proposition, one that differentiates not only from its current offering but also from the approaches adopted by other intermediaries in the sector. This suggests the potential for designing a new service that incorporates users' sustainability-driven motivations and positions SmartBilly as a connector between households, SMEs, and broader environmental objectives.

3.2 The tension around who bears the cost

To introduce the new service, the SmartBilly founders expressed, during the scenario exploration phase previously mentioned, their willingness to integrate a monthly fee. Insights from both the survey and the interviews indicated a feasible range of 2-5 € per month for households and 5-10 € for business customers. According to the founders, such a fee would be necessary to cover the additional operational effort required to exclusively search for green energy offers, an activity that would slow down the provider-selection process, as well as to compensate for the potential loss of revenue embedded in this model. SmartBilly's current business model relies on selecting the cheapest offer available and splitting the resulting savings equally with the customer; therefore, prioritizing the cheapest green option could reduce the company's margins. For a startup in an expansion phase, this represents a significant strategic consideration. On the customers' side instead, the reaction of the different personas to the scenario during the interviews suggested that a substantial share of users, mainly belonging to the *Conscious Changer* and *Aware-but-Hesitant* personas, would appreciate the proposed service. Many perceived SmartBilly as a potential tool to support more sustainable choices and expressed enthusiasm for a service that would facilitate the adoption of greener energy options.

However, the interviews revealed also a critical challenge. Some interviewees, regardless of their persona or interest in sustainability, expressed confusion about the rationale behind the fee and, more importantly, emphasized a desire for the intermediary to "share the risk" with the customer. In their view, if they were willing to request only green offers and potentially accept a slightly higher monthly bill, SmartBilly should likewise be willing to forgo part of its margin. This expectation reflects a belief that the intermediary should share the financial risk to signal genuine commitment and act as a pioneer in promoting sustainable choices. Consequently, the second key learning of this research is that to successfully design its service, an intermediary such as SmartBilly must clearly articulate and communicate its value proposition to justify the introduction of an additional fee.

Before understanding how SmartBilly could justify the introduction of a fee and create additional value for customers willing to pay more, the interviews provided a first clarification regarding the apparent discrepancy identified in the data analysis: while saving money was not a primary driver for choosing green energy, it remained a central reason for subscribing to SmartBilly's service. This suggests that green energy is generally not perceived as inherently cheaper, except among some respondents within the *Aware-but-Hesitant* persona, which explains the low yet present survey score indicating that green energy might be "cheap." By contrast, SmartBilly is consistently associated with savings and financial optimization.

This insight represents a foundational element for service design: even within an opt-in green model, the service must continue to guarantee savings compared to what customers would pay without SmartBilly. Practically, it implies that if no competitive green offer is available during the provider search, SmartBilly should transparently inform the customer, propose a non-green alternative without applying the fee, and resume searching for green options in future cycles. Ensuring clarity, continuity of savings, and transparent communication is therefore essential for maintaining trust and supporting the introduction of the new offer.

Furthermore, several additional features were mentioned, all aligned with two core principles: transparency and simplicity. Respondents envisioned a streamlined dashboard displaying essential, easy-to-understand information, along with a straightforward toggle to activate or deactivate the green-only option. Transparency emerged then as a critical requirement: participants expressed the need for periodic reports on avoided CO_2 emissions, clarity on the origin of their energy, and a visible comparison of the impact of choosing green versus non-green options. These expectations reflect a broader need for credible information that signals seriousness and mitigates the risk of greenwashing, a concern raised during interviews, for instance: "I think that giving as much information as possible strengthens the guarantee and the security of having made the right choice." Moreover, among business customers, an additional "nice-to-have" feature was receiving a sticker to display in shops, leveraging the physical space as a communication tool: "I would use it for communication because if you start small then the message spreads; in shops it's fundamental. The shop becomes a tool to advertise, both for other shops and for private households."

These guarantees of transparency, credibility, and informational richness emerged from the research as fundamental prerequisites for the success and justification of the opt-in service. Within a trusted and secure framework, one that avoids any perception of greenwashing while instead offering clear, evidence-based insights, respondents expressed appreciation also for the sense of community and collective purpose that such a system could generate. Several interviewees, particularly those aligned with the *Conscious Changer* persona, emphasized the desire to "take the step together" with SmartBilly, entrusting the intermediary to guide the transition and to signal, through reports and aggregated impact data, a broader message to institutions and policymakers. This collective dimension highlights users' willingness to act, but also their expectation that SmartBilly positions as a facilitator of coordinated change.

Taken together, these insights constitute concrete recommendations for SmartBilly. Moreover, they open the possibility for a renewed role within the energy ecosystem, one where services like SmartBilly evolve from a mere savings-oriented service to an actor capable of mobilizing, representing, and amplifying the collective commitment of its customer base.

3.3 A new potential role for intermediaries

Beyond the potential new green energy service that SmartBilly could explore, the research uncovered an interesting broader potential role for the intermediaries of the energy sector. In fact, both survey respondents and interview participants expressed a desire for greater "community impact," revealing an aspiration for an actor capable of connecting end customers not only to energy providers but also to the wider institutional landscape, including policymakers. This means that in the energy industry ecosystem, any intermediary like SmartBilly could evolve beyond its traditional function of comparing prices or negotiating contracts and instead become an orchestrator of coordinated change. Such a role would entail facilitating collective sustainable action, amplifying individual choices, and fostering a more integrated dialogue between citizens, market actors, and public institutions.

Fully committing to that role would require a renewed value proposition that builds on previous learnings: understanding the market as composed of distinct customer motivations, not only driven by savings, and designing a safe, trusted service enriched with the additional features needed to ensure transparency and information reliability. By offering credible data, simplifying complex choices, and structuring a clear communication flow, SmartBilly or any similar intermediary could effectively connect households seeking to reduce their impact in all their nuances and personas, small and medium enterprises and local businesses willing to act as a visible example within their communities, green energy providers looking to expand their user base and, importantly, policymakers with environmental ambitions but limited visibility on citizens' everyday behaviors, as observed in the Italian context analyzed in this study.

By operating as a trusted bridge among these actors, intermediaries can help reduce informational gaps, make sustainable choices easier, and foster a shared sense of purpose. This connective role also has the potential to influence even the most reluctant segments, such as the *Pragmatic Saver* persona: through the consistent provision of accessible, low-effort information and the visualization of collective impact, intermediaries may gradually shift them toward more informed and engaged positions, addressing the gap of low motivation to seek information, an issue relevant to every stakeholder, from policymakers to renewable energy providers.

In summary, as a final recommendation, SmartBilly, and similar intermediaries, could adopt a connector-based strategy, leveraging the intermediary position to build a shared, information-rich community that fosters collective progress. By providing transparent information, creating simple reports, and amplifying the collective impact of individual actions, such actors could strengthen their value proposition, enhance trust, and accelerate the adoption of sustainable energy solutions, while also differentiating within a highly competitive market.

4. Conclusive Discussion and Limitations

Before starting the internship, the project was expected to conduct a UX-focused exploration of sustainable services. As it progressed, however, the work evolved into a deeper investigation of consumers' perceptions of sustainable energy and the opportunities for intermediaries to step into a new role in the energy ecosystem. The study eventually explored how a digital energy intermediary such as SmartBilly can support consumers' adoption of green energy through the design of new services.

The research shows that a motivated consumer base exists, even among individuals who initially approach SmartBilly for cost-saving reasons. While the starting assumption was that sustainability would be a secondary or marginal factor for most users, the empirical evidence revealed a more nuanced landscape: many consumers, including those who joined the platform for price considerations, expressed environmental motivations and a willingness to engage more deeply with green options. This insight emerged progressively through the personas' development and their reactions to the scenario tested. What initially raised concerns, namely, that proposing a sustainability-oriented service might alienate users, was challenged by the findings. Instead, the study uncovered a concrete willingness to pay for a service that aligns with users' values, provided that the offer is transparent, credible, and easy to understand.

Taken together, these insights represent recommendations for intermediaries like SmartBilly to move beyond the traditional price-centric logic that characterizes the Italian energy market. They could instead develop services that leverage users' environmental motivations, differentiate the company within the competitive landscape, and contribute to broader decarbonization efforts. This leads to a wider learning: intermediaries may evolve into ecosystem connectors, linking consumers, energy providers, and policymakers, while supporting coordinated, bottom-up contributions to the green transition.

From a managerial perspective, the results encourage SmartBilly to consider the strategic redesign of its value proposition, stepping into the new role of sustainable connector in the energy ecosystem. For policymakers, the study highlights how intermediaries can function as operational partners in achieving European and national climate goals, particularly by increasing consumers' engagement, transparency, and awareness.

Methodologically, the study underscores the value of combining survey data and interviews, typical of service design. The qualitative phase proved essential for uncovering motivations, emotional drivers, and misalignments between expectations and market offerings, elements that quantitative data alone would not capture. The hands-on four-month experience inside SmartBilly further enriched the analysis by providing contextual knowledge of the company's operational constraints, culture, and strategic orientation. This insider perspective helped reinterpret user feedback more accurately and situate the findings within the realities of a startup operating in the Italian energy market.

Several limitations must be mentioned. The exploratory nature of the study and its sample size do not allow for statistical generalization, and further research could expand the dataset. Moreover, the study focused on idea generation without advancing to prototyping or testing; future work could involve co-design workshops or pilot experiments to validate the proposed solutions. Finally, while the personas offer meaningful insights, they represent initial profiles that could be further developed or complemented as user attitudes evolve.

Overall, this study contributes to understanding how small digital intermediaries can accelerate sustainable energy choices. By adopting a service design perspective and recognizing the environmental motivations of their customers, companies like SmartBilly can reposition as active agents of the green transition. In this way, they would support not only market competitiveness but also societal and policy objectives, acting as orchestrators within the complex energy ecosystem.

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Appendix 1: *The Possible Scenarios (Source: Developed by author and SmartBilly founders).*

B2C Scenarios

Scenario 1 – "Green only" Opt-In Service Pack

Description

Customers can activate a "100% Green" mode during onboarding or in their account settings. Once selected, SmartBilly exclusively switches them to providers offering certified renewable electricity. A potential variation includes a small monthly fee for the service, with an optional *Green Trial Period* (3–6 months at no or low extra cost) to test retention and willingness to stay green.

Customer value

- Full delegation with guaranteed green supply
- Simple, commitment-based sustainability choice
- Emotional reassurance ("I am only on renewable electricity")

SmartBilly value

- Clear premium tier and revenue-expansion opportunity
- Brand differentiation from cost-only comparators
- Higher loyalty among environmentally motivated users

Risks

- Low uptake if green tariffs become significantly more expensive
- Requires strong communication on certification (e.g., GO)

Team insights

The team considers this scenario highly feasible and aligned with SmartBilly's future direction. It self-segments customers and does not add operational complexity. A "way out" is required if green tariffs become too costly: SmartBilly could transparently notify customers and offer the choice to return to the cheapest non-green option or to maintain the green tariff at a higher price.

Scenario 2 – Green Priority Rule

Description

By default, SmartBilly selects the cheapest certified green tariff when it falls within a defined percentage (X%) of the absolute cheapest non-green option.

Customer value

- Passive sustainability choice requiring no effort
- Protection from large price deviations

SmartBilly value

- Increased penetration of renewable offers
- Enhanced brand reputation and sustainability positioning

Risks

- Risk of perceived bias
- Complexity in defining and justifying the X% threshold

Team insights

The team perceives this scenario as difficult to communicate and challenging to "sell" to customers due to the complexity of the tolerance percentage. They consider it less suitable and much more difficult to implement. The harshest difficulty is explaining the concept to the customer, as it would add a layer of complexity that doesn't fit in with SmartBilly's value proposition of simplifying the energy market.

Scenario 3 – Hybrid Model with Cost Ceiling

Description

Customers indicate how much they care about green energy (e.g., through a slider from "I do not care" to "Environmentally conscious"). SmartBilly then prioritizes green-certified providers within a predefined cost ceiling, for example, no more than +5% compared to the cheapest non-green offer.

Customer value

- Controlled and predictable energy costs
- Sense of making a responsible choice without overpaying
- Automated, low-effort sustainability behavior

SmartBilly value

- Fits well with the majority of price-sensitive but sustainability-interested customers
- Positions SmartBilly as a rational, balanced advisor
- Potentially strong differentiator ("intelligent green filter")

Risks

- Requires clear communication to avoid misunderstanding
- Needs continuous monitoring of price spreads
- Adds operational complexity

Team insights

The founders find this scenario more intuitive than Scenario 2. They suggested a visual slider mechanism as a concrete way to translate preference levels into cost-ceiling percentages. However, this option would add an administrative and operational complexity for the

SmartBilly team in searching new deals, since every customer would have a different level of interest and a different % willingness to pay to satisfy. This makes this scenario hard to implement, especially at this stage.

B2B Scenarios

Scenario 4 – Green-by-Default for Specific Segments

Description

SmartBilly automatically places selected customer segments, such as HoReCa businesses, eco-conscious SMEs, or users opting in during onboarding, onto green tariffs, unless they explicitly request otherwise. This is facilitated by SmartBilly's existing need to negotiate tailored offers for SMEs.

Customer value

- Image enhancement ("our energy is 100% renewable")
- Eliminates friction by making sustainability the default
- Relevance for both SMEs and households with lifestyle-driven values

SmartBilly value

- Strong differentiation in the B2B market
- Opportunity to build niche leadership (e.g., "SmartBilly powers restaurants and hotels with green energy by default")
- Strengthened relationships with ESG-oriented clients

Risks

- Requires accuracy in reporting
- Possible administrative complexity
- What happens if green tariffs become much more expensive?

Team insights

The team views this as feasible and underexploited. Many existing SME clients are already on green offers; SmartBilly simply has not capitalized on the marketing potential. Negotiating 100% green deals would be consistent with current operations. On the other hand, as in scenario 1, a "way out" is required if green tariffs become too costly.

Scenario 5 – SME Sustainability Communication Kit

Description

SmartBilly provides a service package for small businesses, combining a greener tariff selection, a simple monthly CO_2 report (depending on provider availability), and a communication kit, such as a sticker or short PR text, to publicly display their renewable energy use.

Customer value

- Quick and effortless way to signal sustainability
- Useful for SMEs in hospitality, retail, or image-sensitive sectors

SmartBilly value

- Reinforces SmartBilly's visibility through client-side communication
- Complements Scenario 4 and extends its value
- Requires minimal additional operational complexity

Risks

- Dependence on provider data quality for CO_2 reporting
- Potential administrative overhead

Team insights

The founders consider this scenario viable and synergistic with Scenario 4. They especially appreciate the branding potential: the kit could act as a marketing tool for SmartBilly across restaurants and bars. Nevertheless, the reliance on energy providers data to communicate the CO_2 reports or any other statistic, makes it more difficult to immediately implement.

Appendix 2: *The Survey's Script (Source: Developed by the author).*

SmartBilly - Renewable Energy Survey

Thank you for your time! This brief questionnaire (approx. 3 minutes) helps us understand how to improve our services and promote more efficient and sustainable energy solutions. Your answers are anonymous and used only for academic research and for the improvement of SmartBilly.

1. Are you already a SmartBilly customer? *(Select one option only).*

- Yes, a domestic customer
  - *Automatically redirected to question 5 at the end of the section.*
- Yes, a business customer
  - *Automatically redirected to question 8 at the end of the section.*
- No, but I manage domestic utilities
  - *Automatically redirected to question 12 at the end of the section.*
- No, but I manage business utilities
  - *Automatically redirected to question 17 at the end of the section.*

2. How interested are you in the energy you consume coming from renewable sources (green)? (*Likert scale).*

- Not at all 1---2---3---4 Very

3. To have 100% green energy, would you be willing to pay something extra on your bill? *(Select one option only).*

- No, I only want the lowest price
- Up to 2% more
- Up to 5% more
- More than 5% more

4. What would be the main reasons you would choose green energy? *(You can select multiple options).*

- Reduce my environmental impact
- Support innovation

- Savings and competitive costs
- Reputation with customers / requests from clients (Business only)
- Feel part of a positive change
- Public health benefits
- I would not choose it
- Other: type what

SmartBilly Domestic Customer

If you are not a SmartBilly domestic customer, go back and change your answer to the first question.

5. Would you like to easily activate a "green-only" option to receive energy only from suppliers with 100% renewable energy? *(e.g., with a quick request to SmartBilly or from your personal area)? (Select one option only).*

- Yes, I would like that
- No, it would be useless

6. How much more would you be willing to spend per month to activate the option that guarantees only green energy, knowing that you can deactivate it at any time? *(Select one option only).*

- €0 - I would not spend more
- Up to €1
- Up to €2
- Up to €5
- Other:

7. What should SmartBilly guarantee if it offered you a green plan? *(You can select multiple options).*

- Green supply certificate
- Report on CO_2 not emitted
- Total transparency on conditions
- That there is still a saving compared to my old contract

- Clarity on how much extra I am paying
- That the energy is truly renewable and certified
- Other: type what

SmartBilly Business Customers

If you are not a SmartBilly business customer, go back and change your answer to the first question.

8. Would you like to easily activate a "green-only" option to receive energy only from suppliers with 100% renewable energy? *(e.g., with a quick request to SmartBilly or from your personal area)? (Select one option only).*

- Yes, I would like that
- No, it would be useless

9. How much more would you be willing to spend per month to activate the option that guarantees only green energy, knowing that you can deactivate it at any time? *(Select one option only).*

- €0 - I would not spend more
- Up to €1
- Up to €2
- Up to €5
- Other:

10. What should SmartBilly guarantee if it offered you a green plan? *(You can select multiple options).*

- Green supply certificate to display
- Report on CO_2 not emitted
- Total transparency on conditions
- That there is still a saving compared to my old contract
- Clarity on how much extra I am paying
- That the energy is truly renewable and certified
- Other:

11. If you were to choose a green plan, how useful would it be to receive a certificate to display (in a window/on a website)? *(Liker scale).*

- Not at all 1---2---3---4 Very

Domestic utility manager

What is SmartBilly

SmartBilly is a service that helps families and businesses save time and money by managing their electricity and gas utilities. Customers delegate utility management; SmartBilly searches for the best market offer and handles all the paperwork for the operator change. In addition, it repeats the process cyclically so that the customer always has the most convenient offer on the market.

12. Are you aware of services that help you manage bills and choose the most suitable offer without having to make comparisons and deal with bureaucracy on your own? *(Select one option only).*

- Yes, I know them
- I've heard of them but have never used them
- No, I don't know any

13. When you think about managing your energy bills and supplies, what are the most important aspects for you? *(Select max 2 options).*

- Saving time by avoiding bureaucracy
- Getting the best price available on the market
- Having the certainty that the energy comes from renewable sources
- Having transparent communications and clear bills
- Other:

14. If a service like SmartBilly, which manages your bills and chooses for you, were to offer a green option, how relevant would it be to you? *(Likert scale).*

- Not at all 1---2---3---4 Very

15. How much more would you be willing to spend per month to activate the option that guarantees only green energy, knowing that you can deactivate it at any time? *(Select one option only).*

- €0 - I would not spend more

- Up to €1
- Up to €2
- Up to €5
- Other:

16. What should SmartBilly guarantee if it offered you a green plan? *(You can select multiple options).*

- Green supply certificate
- Report on CO_2 not emitted
- Total transparency on conditions
- That there is still a saving compared to my old contract
- Clarity on how much extra I am paying
- That the energy is truly renewable and certified
- Other:

Business utility manager

What is SmartBilly

SmartBilly is a service that helps families and businesses save time and money by managing their electricity and gas utilities. Customers delegate utility management; SmartBilly searches for the best market offer and handles all the paperwork for the operator change. In addition, it repeats the process cyclically so that the customer always has the most convenient offer on the market.

17. Are you aware of services that help you manage bills and choose the most suitable offer without having to make comparisons and deal with bureaucracy on your own? *(Select one option only).*

- Yes, I know them
- I've heard of them but have never used them
- No, I don't know any

18. When you think about managing your energy bills and supplies, what are the most important aspects for you? *(Select max 2 options)*

- Saving time by avoiding bureaucracy

- Getting the best price available on the market
- Having the certainty that the energy comes from renewable sources
- Having transparent communications and clear bills
- Other:

19. If a service like SmartBilly, which manages your bills and chooses for you, were to offer a green option, how relevant would it be to you? *(Likert scale).*

- Not at all 1---2---3---4 Very

20. How much more would you be willing to spend per month to activate the option that guarantees only green energy, knowing that you can deactivate it at any time? *(Select one option only).*

- €0 - I would not spend more
- Up to €1
- Up to €2
- Up to €5
- Other:

21. If your company adopted green energy through SmartBilly, how would you use it? *(You can select multiple options).*

- As a communication tool for customers (marketing, website, menus, storefronts, etc.)
- As a tool to respond to requests from partners/suppliers from an ESG perspective
- As an internal value choice (consistency with company mission)
- I would not use it actively; it would just be an ethical/environmental benefit
- Other:

22. What should SmartBilly guarantee if it offered you a green plan? *(You can select multiple options).*

- Green supply certificate to display
- Report on CO_2 not emitted
- Total transparency on conditions
- That there is still a saving compared to my old contract

- Clarity on how much extra I am paying
- That the energy is truly renewable and certified
- Other:

23. If you were to choose a green plan, how useful would it be to receive a certificate to display (a decal/on a website)? *(Likert scale).*

- Not at all 1---2---3---4Very

“Your response has been recorded. Thank you!”

Appendix 3: *The interviews' script (Source: Developed by the author).*

1. Introduction

- "Thanks a lot for taking the time to chat with me. I'm Lorenzo, I'm currently doing an internship at SmartBilly while also writing my master's thesis. What I'd like to do is better understand how people see green energy offers and how a service like SmartBilly could present them."

- "Just so you know, everything you say will stay anonymous. There are no right or wrong answers – I'm really just interested in your personal point of view."

2. Questionnaire questions (repeated to ensure it really was anonymous and to connect answers)

- "How much does it matter to you that the energy you use comes from renewable sources?"

- "Would you be willing to pay a little extra on your bill to make sure your energy is 100% green?"

3. Perception of green

- "When you hear the words *green energy* or *sustainability*, what's the first thing that comes to your mind? What's your honest opinion about sustainability and the whole 'green' topic? And more specifically, about renewable energy?"

- "Does this feel like something close to your daily life, or more distant?"

- "Do you think there's a need for middle services that can connect European and national regulations with end customers, like households or small businesses?"

- *(If business)* "Do you think your customers would actually notice or value the fact that your company uses green energy?"

4. Expected value and guarantees

- "If SmartBilly offered you a green energy plan, what would it need to guarantee for you to be convinced? For example: certifications, cost savings, transparency on pricing... Maybe an annual or monthly report? What kind of services, features, or experiences would you expect from a green energy partner?"

- *(If business)* "Would you like to have a certificate or a visible sign to show customers that you use green energy? How would you make use of that?"

5. Motivations and barriers

- "What would be your main reasons for choosing green energy? Just reducing your environmental impact, or something else as well?"

- “And on the flip side, what could hold you back or make you prefer a non-green option?”

- *(If household)* “Would you feel more motivated if the price difference was really small – say, just a few euros per month?”

- *(If business)* “If the green offer was a bit more expensive, would you see it more as a marketing/communication opportunity, or just as an extra cost?”

6. SmartBilly scenarios

- “SmartBilly is thinking about offering customers only 100% green energy plans, even if it comes with a small extra fee. How would you feel about that?”

7. Closing

- “Is there anything I haven’t asked that you think is important to mention on this topic?”

- Final thanks and closing.

Appendix 4: *Main charts and visualizations (Source: Developed by the author).*

Figure 2: Average Green Energy Interest per Age Group | Source: Author's survey

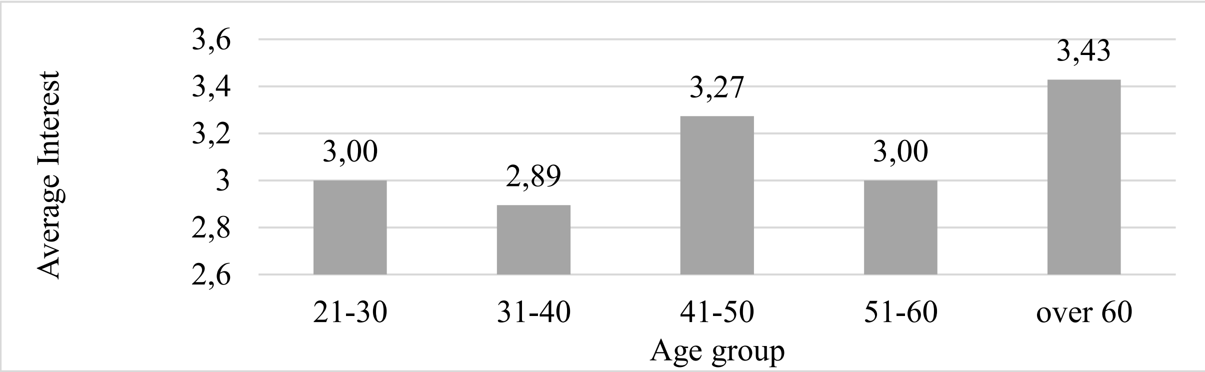


Figure 3: Willingness to pay to energy providers per interest group | Source: Author's survey

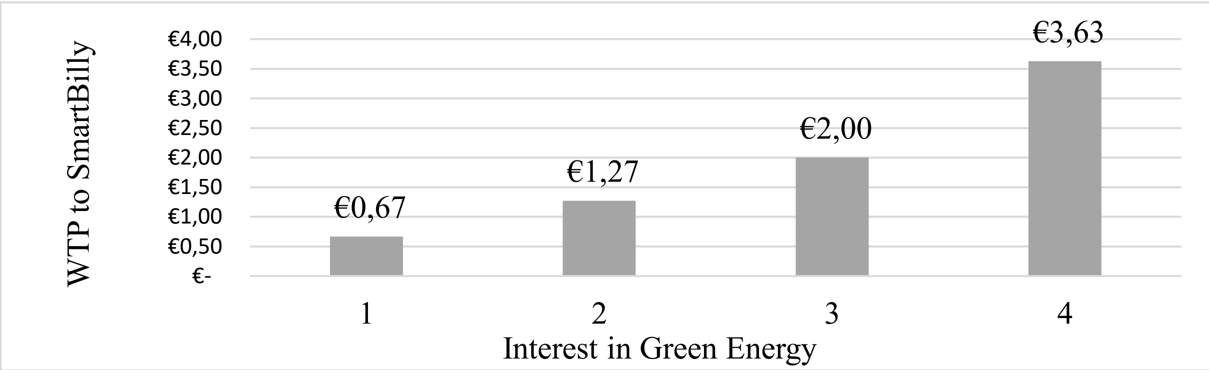


Figure 4: Willingness to pay to SmartBilly per interest group | Source: Author's survey

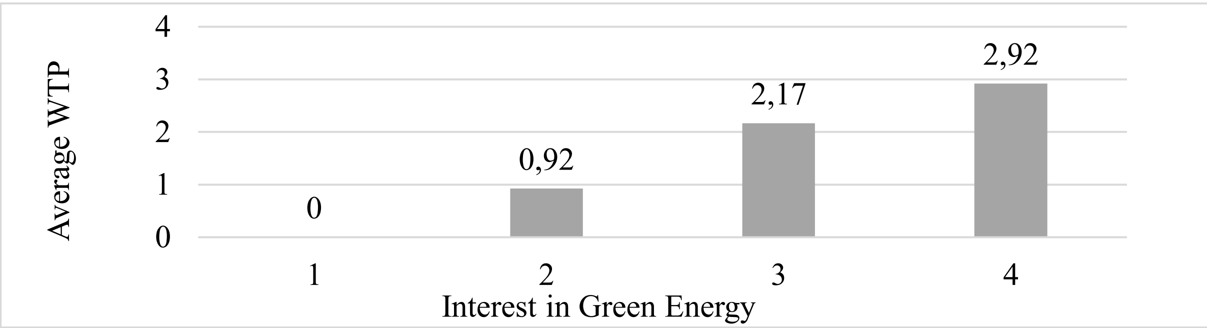


Figure 5: Motivations behind green energy choice | Source: Author's survey

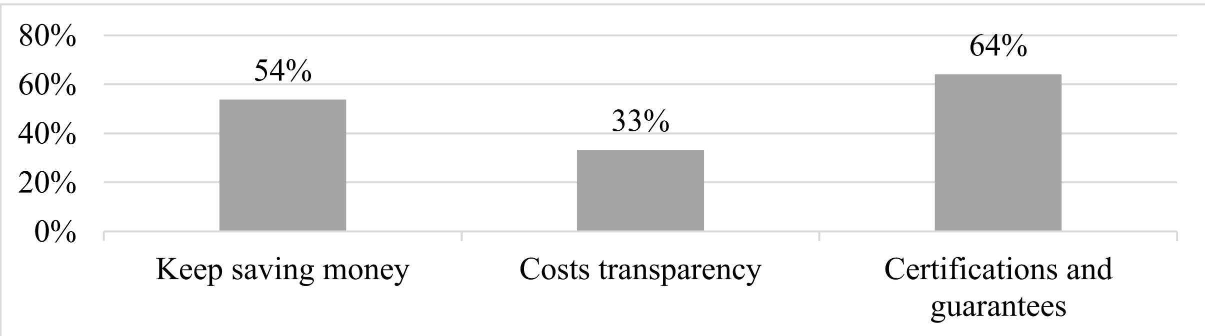
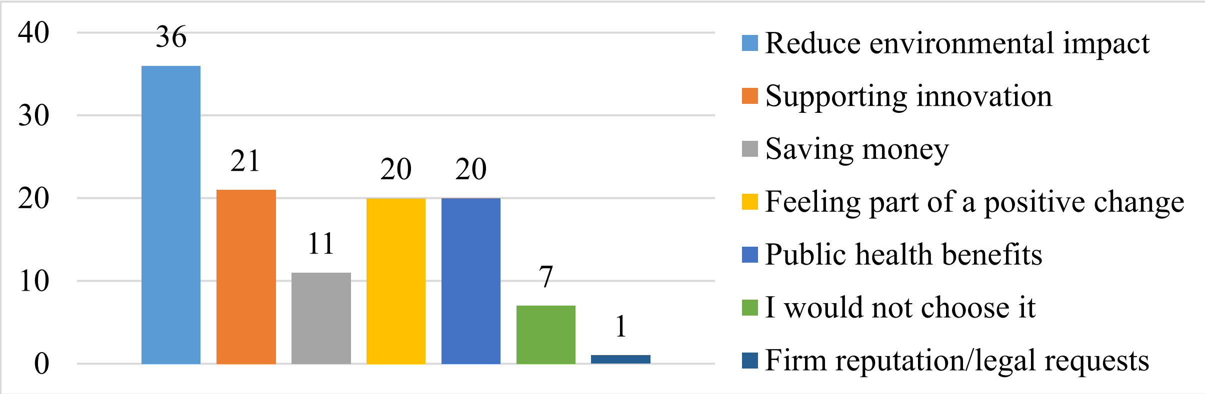


Figure 6: Additional service features mentioned by SmartBilly customers | Source: Author's survey



Appendix 5: *Thematic coding table (Source: Developed by the author).*

Theme (Learning)	Subtheme	Codes included	Relevant quotes
Different motivations and personas' approach to green energy through intermediaries	Limited WTP for green energy, Green energy seen as cheap	Individual does little, Energy comes from nature, Current cost focus of SmartBilly, No interest in sustainability, Not paying more, Renewables cannot satisfy the entire world's energy demand, Old fashioned mentality, Ignorance, Not a necessity, Savings, Feel the weight of the extra expense, Not a priority, Green energy has some problems too.	"Precisely because it's green it shouldn't be considered more expensive and to encourage people, they shouldn't have to pay more". "Since it comes from nature, I imagine lower costs". "First I must be able to manage the cost, that's why I used SmartBilly ". "If for a 100 euro bill, they asked for 102 to have 100% green energy, I could be convinced. But not more, because beyond that I would start to feel the weight of the extra expense".
	Motivated WTP, High WTP	Support to innovation, Seeing a visual impact, Sense of community, 5% more, See the impact, Support transition and the necessary conditions, WOM, Contributing to the reduction of pollution, Not an opportunity, Yes if not heavy and it's simple and real.	"It's an option I understand cannot be free, it requires efforts from the suppliers". "Give support to innovation". " To feel part of the group that is changing things". "Even the smallest contribution from an individual can help shut down a fuel power plant in favor of sustainable energy".
	Sustainable practices and interest in sustainability	Public health, Support to innovation, Separate waste collection, Minimizing the impact, Circularity, Social well-being, Taking care of the next generations, Alternative transport, Not taking the car, Doing my part for the good cause, Exploiting unlimited resources, Setting an example, Peace of mind.	"In general, it's a necessary step and the human mind must try to exploit every possible source of clean energy". "Sustainability must become an essential element of the economy". "We can all contribute to making the world a healthier place". "I believe that taking care of the planet is also taking care of the next generations". "I think of the idea of exploiting what nature already offers us, without burning resources".

Unclear cost ownership and greenwashing prevention	WTP to SmartBilly	Effort from both sides, 5€, Fixed monthly fee, 10€, Confusion on who bears the cost, 2€, SmartBilly as an example, Doing the right move together, Automatic choice if small fee, Opt-in as the best solution.	"I am willing to give something to the supplier, not to the intermediary". "Even just 2 or 3 euros more per month would make the difference. At that point the choice would become almost automatic, a small gesture for collective benefit without worries. The barrier would almost completely disappear".
	Green energy as a business leverage	Advertisement, Communication, Word Of Mouth.	"I would use it for communication because if you start small then the message spreads, in shops I think it's fundamental". "The shop is a tool to advertise, both for other shops and for private individuals and their homes".
	Additional service features	Annual report, Sticker, Knowing the source, Selecting the source, Reports on laws and regulations, CO_2 emissions report, Statistics, Highlighting differences of choosing or not green energy, Where it is produced, Simple to understand data, Simple dashboard.	"I prefer wind and solar, less hydroelectric". "I would like to know where it is produced. I think, in fact, that giving as much information as possible strengthens the guarantee and the security of having made the right choice". "Perhaps also with a comparison like it's the equivalent of planting x trees or it's the CO_2 absorbed by x trees in x time".
	Need for transparency, Need for awareness, Need for information	Guarantees of origin, Certificates, Avoid greenwashing, Information to prove seriousness, Current lack of information, Green seen as a trend, Marketing.	"Certainly, the current scenario does not allow the end user to have complete information and make a conscious choice". "But, sometimes, all the talk about "green" seems a bit like a trend, a term used by everyone to look good. I get the doubt that for many companies it's more a question of marketing than a real willingness to change things".

A new opportunity for digital intermediaries in today's energy industry ecosystem	SmartBilly role as a connector, New value proposition	Connect and stimulate small players, Move in the right direction with an economic return, Shape the market, Raise awareness with informative content, Clear communication, Connect to a broader cause, Small shops as pioneers and mean of Word Of Mouth, Difficult bureaucracy and confusing info.	"Become pioneers in changing energy supply towards green". "Offering an easy way to reduce the environmental footprint to people that would probably not do it alone. So, I see it as a service that connects households and small businesses to a broader cause". "I think it's nice to offer an intermediary service that teaches the smaller and more ignorant ones how to be more sustainable".
	Policymakers' role	Governments subsidies, Giving a signal to governments, No media pressure, Want for incentives and subsidies.	"It serves to sensitize governments by showing that there is interest and they can then offer more services regarding it". "I don't feel enough media pressure, and this translates into laziness on my part or a lack of civic sense".