How can green suppliers boost customer loyalty? Model proposition for energy markets

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Abstract

Purpose – Clean and sustainable energy becomes an alternative to differentiate electricity suppliers, but it is necessary to have a better understanding of their behaviour to achieve green customer loyalty. This paper aims to deploy a behavioural model that helps explain loyalty of customers towards green electricity providers by including a series of antecedents such as trust, satisfaction, perceived environmental impact, propensity to trust and perceived risk.

Design/methodology/approach – The paper deploys a behavioural model that it is tested through structural equation modelling to a sample of 231 German electricity consumers with green contracts. The data analysis included two steps: first, the development and validation of the scales used to measure the constructs proposed in the model, and second, the model test.

Findings – Results demonstrate that trust and satisfaction directly influence loyalty, while satisfaction and the other variables included in the model have an indirect relationship with loyalty mediated by trust and satisfaction. As green characteristics of electricity are difficult to evaluate, managers should demonstrate in their communication the environmental effects of their activities while emphasising their capacity to attend to supply requirements for building long-term customer relationships.

Originality/value – The paper is focused on the understanding of those consumers who have signed a green electricity contract and the antecedents associated to their loyalty. The behavioural model helps identify how managers should apply marketing strategies to foster green consumers loyalty.

Keywords Loyalty, Satisfaction, Trust, Green consumption, Green supplier

Paper type Research paper

1. Introduction

Green products, that is, “products (tangible or intangible) that minimise their environmental impact (direct and indirect) during their whole life cycle, subject to the present technological

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and scientific status” (Sdrolia and Zarotiadis, 2019, p. 164) are gaining presence in consumer markets due to global warming and pollution (Chen, 2016; Kahraman and Kazançoglu, 2019; Yarimoglu and Binboga, 2018). Based on the environmental advantages they provide and the existence of consumers willing to pay a premium for them (Ntanos et al., 2018; Skordoulis et al., 2020), managers may reconsider their business strategies to adopt sustainability to differentiate their firms from competitors (Kahraman and Kazançoglu, 2019).

Particularly in energy markets, many customers are interested in contracting providers whose energy comes from renewable sources as they reduce pollution and impact on global warming (Chen, 2016; Hentschel et al., 2018; Mezger et al., 2020a). Thus, green electricity, which is entirely generated from renewable energy sources with a low impact on the environment, has become an interesting alternative (Strupeit and Palm, 2016). Indeed, after the liberalisation of markets, new providers appeared to see green electricity affecting consumer intention to switch, which was followed by reduced loyalty (Diaz-Rainey and Ashton, 2011; Kaenzig et al., 2013).

Loyalty is a key construct in marketing research, particularly in relationship marketing, due to its positive effects on companies (Morgan and Hunt, 1994). Loyal customers, among other characteristics, tend to buy more, be less price-sensitive and spend a larger share of their incomes on the firm (including cross-selling), favour word-of-mouth communication and have low or even no intention to switch to or choose another product or supplier (Bhojak et al., 2023; López-Miguens and González, 2017; Wieringa and Verhoef, 2007). Customer loyalty thus becomes a strategic objective for companies, mainly in the service industry (Polo et al., 2013).

Nevertheless, customer loyalty is also affected by product attributes. Electricity markets are particularly characterised by regular buying decisions, a homogenous product and low product involvement and so they are usually categorised as “no loyalty” and “spurious loyalty” products (Dick and Basu, 1994), and consumers often want to change their electricity supplier (Wieringa and Verhoef, 2007). However, most consumers continue with their provider due to uncertainty about new entrants or supply stability (Hartmann and Apaolaza-Ibañez, 2007; Hortaçsu et al., 2017) or to avoid transaction costs (Kaenzig et al., 2013). Additionally, there is almost no variation in product quality, and the possibility of differentiating between competitors is limited; consumers buy electricity without reflecting on their decision, which is mainly based on familiarity (Dressler and Nickenig, 2009). In this regard, managers may look for differential strategies in energy markets (Akroush et al., 2019), and “green” energy is an attractive option (Shin and Managi, 2017). In parallel to strategic concerns about green energy, some companies add new uncertainties that can generate distrust towards green alternatives as they claim to be sustainable ones when they are not (Chen et al., 2014; Kahraman and Kazançoglu, 2019). This practice, known as greenwashing, has a negative influence on consumers’ attitudes towards green products (De Jong et al., 2018), affecting trust in green electricity providers (Mezger et al., 2020a). This situation adds complexity when generating loyalty in a green energy context.

Therefore, this paper aims to identify the main antecedents of green consumer loyalty to develop and validate an overarching model that can explain the behaviour of this variable. This deeper understanding of those clients who have signed a clean energy contract will provide insights for managers to develop strategies that help customer engagement while improving environmental impact through sustainable strategies (Kikuchi-Uehara et al., 2016; Mezger et al., 2020b).

Specifically, this research offers a series of contributions to current literature. Firstly, it develops a structural model of customer loyalty towards green electricity providers that includes the four steps of the model by Oliver (1997, 1999), that is, cognitive, affective, conative and action. Secondly, the model explains the 43.5% on the variance of green
customers’ loyalty, higher than in previous models. Thirdly, a series of antecedents to loyalty adapted for the green energy context are identified: satisfaction, trust, environmental perception impact, perceived risk and the propensity to trust (Drosos et al., 2020; Kikuchi-Uehara et al., 2016; Mezger et al., 2020a). Regarding previous literature, satisfaction and trust were identified as highly significant variables in loyalty creation (Drosos et al., 2020; Garcia-Acebron et al., 2010; Hartmann and Apaolaza-Ibáñez, 2007), it is thus necessary to include them in an overarching model. The model also includes the variables perceived risk (Chen and Chang, 2012), propensity to trust (McKnight et al., 2002; Mezger et al., 2020b) and environmental perception impact (Chen and Chang, 2013; Chen et al., 2015; Hartmann and Apaolaza-Ibáñez, 2012), closely related to satisfaction and/or trust in the green energy context and, consequently, considered loyalty enablers. Fourthly, the scales to measure all variables included in the model were developed and validated for the specific research context.

With these objectives, the paper is organised as follows. Firstly, the theoretical framework is presented, including a description of the theoretical model prepared to explain customer loyalty towards a green electricity supplier. Secondly, the methodology is detailed and thirdly, the results are given, which include the development and validation of scales, and the model test. The fourthly, the last section discusses the results, explaining the theoretical and practical implications, and limitations and future research.

2. Theoretical background
2.1 Loyalty model in a green energy context
Customer loyalty is one of the key constructs in marketing research and an aspirational objective of marketing managers due to its positive effects for firms. Loyal consumers buy more, are less price sensitive, show a lower switching intention and spend a higher share of their incomes on the firm (Bhojak et al., 2023; Wieringa and Verhoef, 2007). Particularly, loyalty is defined as:

The intention to perform a diverse set of behaviours that signal a motivation to maintain a relationship with the focal firm, including allocating a higher share of budget to the specific service provider, engaging in positive word of mouth and repeat purchasing (Sirdeshmukh et al., 2002, p. 20).

However, as loyalty depends on the contingencies of the industry and firm, the roadmap to achieving long-term relationships with customers differs among industries. Electricity markets are very particular: the product is homogeneous, with low involvement from customers and their purchase is based on regular buying decisions (Dressler and Nickenig, 2009). Specifically, after market liberalisation, electricity company managers have faced fierce competition to keep consumers and greater difficulty when differentiating their firms (Diaz-Rainey and Ashton, 2011; Shin and Managi, 2017); the emergence of green energy has become an opportunity to gain some differentiation.

Traditionally, scholars outline two approaches for studying loyalty: behavioural and attitudinal (Apaolaza-Ibáñez et al., 2006; Bandyopadhyay and Martell, 2007). The former is based on an ex post evaluation of consumer behaviour (Foscht and Swoboda, 2011), and the latter adds behavioural factors that favour a good attitude (Dick and Basu, 1994; Oliver, 1999). As they are complementary at explaining the underlying factors (how and why) of loyalty (Dick and Basu, 1994), this research combines both approaches, which are integrated in the model proposed by Oliver (1997, 1999) to understand the construct of loyalty. It includes four phases – cognitive, affective, conative and action – to generate loyalty,
increasing consumer commitment as the stages advance. In the cognitive, the consumer assesses certain elements of the product/service. In the affective, the emotions associated to the use or consumption come into play. The conative relates emotions to behavioural intentions. Finally, the action implies a specific behaviour.

Oliver’s model motivates the theoretical framework, as this study proposes loyalty as a consequential variable for current customers of green electricity providers. Therefore, it is proposed that loyalty is explained by the trust in and satisfaction with the current green energy provider (Drosos et al., 2020; García-Acebrón et al., 2010; Hartmann and Apaolaza-Ibáñez, 2007), the perceived environmental impact of the company as it is assumed to be sustainable (Chen and Chang, 2013; Chen et al., 2015; Hartmann and Apaolaza-Ibáñez, 2012), the perceived risk to the provider associated with electricity being a basic element in daily life (Chen and Chang, 2012) and finally, the propensity to trust (McKnight et al., 2002; Mezger et al., 2020b). Trust and satisfaction have been traditionally considered as loyalty generators in the literature, while the other variables have received less attention. Trust is considered as a conative variable (Mezger et al., 2020a), Satisfaction a cognitive and affective one (Oliver, 1980; Bagossi et al., 1999). Perceived environmental impact, Perceived risk and Propensity to trust are cognitive variables (Eggert and Ulaga, 2002; Sweeney et al., 1999) and Loyalty is a conative and action variable (Sirdeshmukh et al., 2002).

Based on the previous literature review on consumer loyalty and the underlying reasoning, a system of seven hypotheses on antecedents to explain loyalty towards green energy providers is generated. The model suggests:

- a direct relationship between loyalty and the variables Trust ($H_1$) and Satisfaction ($H_2$);
- an indirect relationship between Perceived risk ($H_5$) and Propensity to trust ($H_6$) with Loyalty as a variable mediated by Trust; and
- an indirect relationship between Perceived environmental impact and Loyalty mediated by Satisfaction and Trust ($H_3$, $H_{4a}$ and $H_{4b}$).

This overarching framework will be developed in the following sections as reflected in Figure 1.

2.2 Antecedents of loyalty

2.2.1 Trust. Trust is defined as “the attitude of an electricity consumer towards its provider, considering that this provider acts in an environmentally responsible manner by competently and sustainably supplying electricity that (based on its origin) can be considered ‘green’ (i.e. ecologically worthwhile and responsible) while engaging with consumers openly and authentically through its marketing activities” (Mezger et al., 2020a, p. 8). It thus includes dealing with uncertainty on the providers’ performance, the potential risk of loss as well as the belief that the benefits outweigh the risks (Walsh et al., 2006).

Trust is highly context specific (Castelfranchi and Falcone, 2010) and green electricity markets are especially complex. Green electricity is a highly opaque product as its actual source cannot be verified; potential fraud, supply security and electricity source are among several factors that cannot be substantiated before (or even after) purchase. Additionally, electricity customers may deal with information asymmetries and lack of information, so they must simply trust in the product quality and in the promises of the suppliers (Walsh et al., 2006). Trust is a well-known lever that can lower complexity (Luhmann, 1989), deal with uncertainty (Mayer et al., 1995), manage customer relations (Delgado and Munuera, 2005; Morgan and Hunt, 1994) and it is central for long-term relationships and loyalty.
The generation of business trust makes it possible to cultivate a market advantage in the company’s consumer base, through a closer customer-company relationship (Mangus et al., 2020; Martínez, 2015). Therefore, trust in the provider becomes a conative variable and a core construct to reduce transaction costs and conquer loyalty (Mezger et al., 2020a).

In the case of green electricity, the connection between electricity customers and trust has been an object of interest (Bakay, 2003; Hartmann and Apaolaza-Ibáñez, 2007). Some researchers suggest an indirect relationship of trust and loyalty through customer commitment (Bakay and Schwager, 2006; Galus and Schwabe, 2008): the greater consumer trust in a supplier, the greater commitment there is with the supplier, the greater the consumer’s commitment and the greater loyalty they will have towards an electricity supplier. However, a direct relationship is also suggested between loyalty and trust, which is a repurchase behaviour combined with an attitudinal component (Hartmann and Apaolaza-Ibáñez, 2007). Therefore, trust is expected to have a positive impact on customer loyalty. Thus, the following hypothesis can be formed:

**H1.** Consumer trust in green electricity suppliers enhances customers’ loyalty to green electricity suppliers.

### 2.2.2 Satisfaction

In this research, we understand satisfaction from two streams reflected in the literature. The cognitive approach (Oliver, 1980) is understood as the accomplishment of expectations by the consumer, and the affective approach, that considers satisfaction as an emotional state generated by the evaluation of the satisfaction of consumers with their provider over time (Bagozzi et al., 1999).
The influence of satisfaction on loyalty is widely supported in the literature (Anderson et al., 1994; Garbarino and Johnson, 1999). Customer satisfaction is a requisite to develop loyalty (Oliver, 1997). When consumers are satisfied with a company’s performance, they tend to develop higher levels of loyalty, translated into repurchasing and product recommendations (Bhojak et al., 2023). Hence, a satisfied consumer is not only open to maintaining a relationship with a firm but also when new competitors enter into the market (Drosos et al., 2020). In the green energy context, satisfaction also favours loyalty (Apaolaza-Ibáñez et al., 2006; Bakay, 2003; Bakay and Schwaiger, 2006; Bhojak et al., 2023; Walsh et al., 2006). The importance of this relationship is greater as few unsatisfied clients formalise their complaints, ending the relationship with the company while producing negative word-of-mouth (Pascual-Nebreda et al., 2023; Walsh et al., 2006). Electricity providers thus intend to improve customer loyalty by increasing the level of satisfaction of the customer (Apaolaza-Ibáñez et al., 2006; Bhojak et al., 2023). In fact, due to the difficulty in generating trust in the context of green energy, this relationship becomes more important than in traditional business. Built on this argumentation, this study suggests the following relationship in green electricity markets:

**H2.** Consumer satisfaction favours increased loyalty in green providers.

Many studies suggest that satisfaction favours trust. This could also be said of green electricity markets because if a consumer trusts a green energy provider, they implicitly consider that it is responsible for protecting both its own and others’ interests, is honest and reliable in its behaviour and competent in the service provision (Gustafsson, 2005). Research into electricity markets research has demonstrated that the higher a consumer’s satisfaction with a supplier, the greater their trust in the supplier (Bakay and Schwaiger, 2006; Bhojak et al., 2023; Galus and Schwabe, 2008). This will lead consumers to develop satisfaction in their relationship with the provider. So, the next hypothesis is proposed:

**H3.** Consumer satisfaction favours increased trust in green providers.

2.2.3 Perceived environmental impact. Perceived environmental impact is built upon the concept of green perceived value of Chen and Chang (2012), under a cognitive perspective (Eggert and Ulaga, 2002). Green perceived value can be defined as:

a consumer’s overall appraisal of the net benefit of a product or service between what is received and what is given based on the consumer’s environmental desires, sustainable expectations and green needs (Chen and Chang, 2012, p. 505).

“Green” essentially represents an additional value to customers (Hartmann and Apaolaza-Ibáñez, 2012).

The relationship between perceived value and satisfaction has been studied widely in the literature, and perceived value is mostly considered as an antecedent of satisfaction (Aurier and N’Goala, 2010). This relationship is considered critical as both constructs come from consumer evaluations (Woodruff, 1997). However, this research consideration of satisfaction as a cognitive and affective construct leads these constructs (perceived environmental impact and satisfaction) to be considered complementary (Eggert and Ulaga, 2002). The satisfaction arises after purchase, and the perceived value depends on the moment, so it can be before or after purchase (Eggert and Ulaga, 2002; Sweeney and Soutar, 2001). If the benefits composing the perceived value prevail, consumer satisfaction will be achieved. On the contrary, if efforts exceed benefits the satisfaction will be reduced (Wang et al., 2004). This relationship is expected to occur in energy markets, suggesting the next hypothesis:
H4a. Perceived environmental impact increases consumer satisfaction with green electricity suppliers.

On the other hand, several studies have shown that perceived value serves as an antecedent to trust (Pavlou and Gefen, 2004) by pinpointing the positive relation between perceived value and consumer trust (Chen and Chang, 2012). Those consumers willing to buy “green” products expect a positive environmental impact (Hartmann and Apaolaza-Ibáñez, 2012) and the perceived environmental impact plays an important role in determining the level of green trust (Chen and Chang, 2013; Chen et al., 2015; Mezger et al., 2020b). Nevertheless, exaggerated attributes of “being green” and claims of environmental impact lower consumers’ trust in such products if the claims are proven to be not fully true (Kalafatis et al., 1999). For green electricity, the relationship between the perceived value of buying electricity from a green supplier and trust in this supplier is especially important, and it becomes an antecedent of trust. Based on this argumentation, the following hypothesis can be formed:

H4b. Perceived environmental impact increases consumer trust in green electricity suppliers.

2.2.4 Perceived risk. Perceived risk, understood as the subjective expectation of losses during a purchase decision, is a consumer’s subjective evaluation (Sweeney et al., 1999). It reflects the balance between the perceived value for money and the expected future costs (Sweeney et al., 1999), suggesting a measure of risks associated to poor decision-taking (Rampf et al., 2012). Furthermore, trust is intimately associated with risk during long-term relational exchanges (Kantsperger and Kunz, 2010), becoming a consequence of risk during relationships (Yadav et al., 2018).

In electricity markets, prior research has shown that perceived risk has a negative effect on trust (Chen and Chang, 2012). Perceived risk during decision taking suggests continuing the relationship with the green supplier. If consumers perceive high risk, they are unwilling to trust the product or service (Chen and Chang, 2012), focusing their decision on service quality or other functional benefits (Ng et al., 2014). Green electricity is characterised by high credence qualities although it is impossible to ascertain product characteristics before, during or after purchase. Especially in green electricity markets, information asymmetry exists. This asymmetry in green offerings precludes consumers from identifying actual product value before purchase, which may encourage sellers to act dishonestly (Mishra et al., 1998). Furthermore, consumers associate substantial (perceived) risks with newly emerged green electricity suppliers (e.g. supply issues, “actual greenness” of electricity sources). Therefore, trust acts to reduce the likelihood of suffering from such risks, and customers are more prone to stay with their current supplier. Hence, in the context of green electricity, perceived risk should negatively affect trust, which allows the following hypothesis to be formed:

H5. Perceived risk decreases consumer trust in green electricity suppliers.

2.2.5 Propensity to trust. Whether and to what extent people trust others depends on personal traits, and it is reflected in the literature through a construct called “propensity to trust” (Mayer et al., 1995). It can be defined as a “generalized expectation about the trustworthiness of others” (Mayer et al., 1995, p. 715), reflecting the amount of trust a trustor has for a trustee without considering data or information about the parties. Propensity to trust is thus a stable personal trait that affects the likelihood or general willingness of a person to trust others (Morrow et al., 2004) or, framed differently, to depend on others
McKnight et al., 2002). Generally, it is invariant across situations and not easily altered by marketing efforts (Kenning, 2008) and different among individuals (Mayer et al., 1995).

Propensity to trust is often considered as a direct antecedent to trust (Lu et al., 2010; McKnight et al., 2002). A person’s overall disposition to trust directly increases the level of trust, especially in situations where transaction parties are unfamiliar with each other and before in-depth relationships emerge (Gefen, 2000). Thus, a consumer’s propensity to trust not only impacts perception but also behaviour during novel or unfamiliar situations (Morrow et al., 2004). The tendency to trust in others raises the overall level of trust a person shows. This effect emerges regardless of other determinants of trust.

In the case of green electricity suppliers, most companies are unfamiliar and customers have no prior relationships with them (Hortaçsu et al., 2017). Thus, propensity to trust in such situations plays an important role. Based on this consideration, the present study hypothesises a direct link between propensity to trust and trust:

\[ H6. \text{ Propensity to trust increases consumer trust in green electricity suppliers.} \]

### 3. Method

The sample used for the research were recruited in the socio-scientific panel, an online panel based in Germany. The probabilistic procedure applied was proportional stratification, using gender and the proportion of green electricity contracts with respect to conventional ones as stratification variables. The sample characteristics are close to the general population, as reflected in Table 1. The number of respondents to the online questionnaire who have a contract with a green energy supplier was 231. It supposes a confidence level of 95\% and 6.40\% of sampling error under the conditions of \( p = q = 0.5 \).

The data analysis was deployed in two steps:

1. development and validation of the scales used to measure the constructs proposed in the model, and
2. model test through structural equation modelling (SEM).

The best practice procedures suggested by Hair et al. (2019a), Hair et al. (2019a), 2019b, 2019c and Wright et al. (2017) were followed for the first step. The process thus starts with the generation of items and later the psychometric properties (dimensionality, reliability, convergent and discriminant validity) are analysed for each scale. The second step was the

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Total population (%)</th>
<th>Sample (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching behaviour</td>
<td>Yes</td>
<td>32.80*</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>67.20*</td>
</tr>
<tr>
<td>Share of green/conventional electricity contracts</td>
<td>Male</td>
<td>49.1**</td>
</tr>
<tr>
<td>Gender</td>
<td>Female</td>
<td>50.9**</td>
</tr>
<tr>
<td>Age</td>
<td>Under 30</td>
<td>30.6**</td>
</tr>
<tr>
<td></td>
<td>30–49</td>
<td>28.5**</td>
</tr>
<tr>
<td></td>
<td>50–64</td>
<td>20.4**</td>
</tr>
<tr>
<td></td>
<td>Over 64</td>
<td>20.6**</td>
</tr>
</tbody>
</table>

**Table 1.** Switching behaviour, type of contract and demographics (German population vs sample \( n = 231 \))

**Sources:** Authors’ own creation from *BDEW (2013);**Destatis (2013); **Bundesnetzagentur (2019);** Monitoringbericht (2018)
test of the causal relationship between constructs established in the model using the partial least squares (PLS) software package (Ringle et al., 2015). To guarantee data stability at a confidence level of 95%, a bootstrapping analysis was made with 5,000 samples extracted from the original data, the size of these sub-samples being equal to the size of the original data sample (Hair et al., 2019a, 2019b, 2019c).

4. Results

4.1 Scale development and validation

All variables included in the model are reflective and its development was based on an extensive literature review, following the procedure suggested by Cooper and Hedges (1994). Through this process, the initial items that cover the concepts associated to the constructs were identified, adapting them to the research context. All questions were evaluated using a five-point Likert scale (1 = totally disagree, 5 = totally agree). The number of items for each variable and associated literature appears in Table 2. Next, those items were reviewed in accordance with the elimination criteria (Hardesty and Bearden, 2004): redundancy, double argumentation, connotations conditioning the response of surveyed and ambiguity. The refined list was used to develop the scales in the next steps.

Later, the psychometric properties of the scales were checked following the guidelines in Churchill (1979) and Anderson and Gerbing (1982). To this end, the dimensionality of the scales was first analysed, which allowed us to know their factorial structure. Previously, the appropriateness of data was assessed to deploy the factor analysis (Table 3). In this regard, we verified that the determinant of the correlation matrix for each scale was close to zero, the p-value for the Bartlett sphericity test is lower than 0.05 and that the result of the Kaiser-Meyer-Olkin test was close to one (Lévy and Varela, 2003). Once those elements had been checked, an exploratory factor analysis (EFA) was carried out, using Main Components and Varimax rotation as the extraction method. To establish the number of factors, it was required that the eigenvalues exceed the unit, a percentage of the explained variance above 60% and the communalities higher than 0.50 (Hair et al., 2010). The EFA results indicated that the Trust and Perceived risk scales were multidimensional and multilevel of the second order, and the rest were unidimensional.

To analyse the reliability of scales, two tests were performed: Cronbach’s alpha (CA) and composite reliability (CR). Results included in Table 4 show values for CA between 0.821 for the construct Perceived risk and 0.946 for Trust. The CR values range from 0.876 for Perceived risk and 0.953 for Trust. Those values widely exceed the recommended threshold.

<table>
<thead>
<tr>
<th>Variable (number of items)</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust (15 items)</td>
<td>Mezger et al. (2020a, 2020b)</td>
</tr>
<tr>
<td>Satisfaction (three items)</td>
<td>Adapted from Chen and Chang (2013)</td>
</tr>
<tr>
<td>Perceived environmental impact (six items)</td>
<td>Adapted from Chen and Chang (2012), Arkesteijn and Oerlemans (2005), Patterson and Spreng (1997)</td>
</tr>
<tr>
<td>Perceived risk (five items)</td>
<td>Adapted from Sweeney and Soutar (2001), Malhotra et al. (2004)</td>
</tr>
<tr>
<td>Propensity to trust (six items)</td>
<td>Adapted from Becerra and Korgaonkar (2011), Lee and Turban (2001), McKnight et al. (2002)</td>
</tr>
<tr>
<td>Loyalty (seven items)</td>
<td>Adapted from Chaudhuri and Holbrook (2001), Loureiro et al. (2014)</td>
</tr>
</tbody>
</table>

**Source:** Authors’ own creation

| Table 2. Proposal for scales to measure energy markets |
Table 3. Dimensionality of scales

<table>
<thead>
<tr>
<th>Construct/dimension</th>
<th>Items</th>
<th>Determinant</th>
<th>KMO</th>
<th>Barlett’s sphericity test</th>
<th>Explained variance</th>
<th>Rotated factor load</th>
<th>Communality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust</td>
<td>15</td>
<td>2.11E-007</td>
<td>0.914</td>
<td>3.456.111 (0.000)</td>
<td>83.392</td>
<td>(0.807–0.851)</td>
<td>(0.800–0.884)</td>
</tr>
<tr>
<td>Authenticity</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responsibility</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Openness</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.758–0.892)</td>
<td>(0.755–0.916)</td>
</tr>
<tr>
<td>Competence</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.687–0.752)</td>
<td>(0.853–0.863)</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>3</td>
<td>0.158</td>
<td>0.731</td>
<td>421.689 (0.000)</td>
<td>84.458</td>
<td>(0.687–0.752)</td>
<td>(0.768–0.862)</td>
</tr>
<tr>
<td>Perceived environmental impact</td>
<td>6</td>
<td>0.049</td>
<td>0.853</td>
<td>683.340 (0.000)</td>
<td>62.701</td>
<td>(0.591–0.704)</td>
<td></td>
</tr>
<tr>
<td>Perceived risk</td>
<td>5</td>
<td>0.079</td>
<td>0.710</td>
<td>578.356 (0.000)</td>
<td>81.928</td>
<td>(0.727–0.898)</td>
<td></td>
</tr>
<tr>
<td>Supplier selection risk</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Propensity to trust</td>
<td>5</td>
<td>0.116</td>
<td>0.859</td>
<td>489.602 (0.000)</td>
<td>64.127</td>
<td>(0.528–0.746)</td>
<td></td>
</tr>
<tr>
<td>Loyalty</td>
<td>6</td>
<td>0.035</td>
<td>0.868</td>
<td>762.281 (0.000)</td>
<td>65.727</td>
<td>(0.524–0.732)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors’ own creation
of 0.70 (Hair et al., 2010) in both proofs and for all constructs, suggesting a high reliability of all scales.

The convergent validity of scales was evaluated through the average variance extracted (AVE) and the factor loads obtained through the bootstrap analysis to guarantee results (Table 4). All AVE values exceed the threshold of 0.50 (Fornell and Larcker, 1981) and the factor loads are above 0.70 and are significant (Carmines and Zeller, 1979). As a consequence, the convergent validity is confirmed for all scales.

The discriminant validity of the developed scale was analysed through three tests. The ratio between correlations heterotrait-monotrait (HTMT) (Henseler et al., 2015) is below 0.85 in every case (Kline, 2011). The Fornell and Larcker (1981) criterion is accomplished; the square of the correlation between every pair of constructs is compared with the AVE of each one of those constructs, in all cases the first value exceeds the second one. Finally, the cross loads are analysed and checked (Chin, 1998). Tables 5 and 6 show results demonstrating the existence of discriminant validity between constructs, so they are different at the conceptual level.

Once the scales had been validated, the descriptive analysis (mean and standard deviation) was performed and reflected in Table 7. Satisfaction receives the highest mean

<table>
<thead>
<tr>
<th>Construct/dimension</th>
<th>Items</th>
<th>Factor loading</th>
<th>Bootstrap confidence intervals</th>
<th>CA</th>
<th>CR</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust</td>
<td>15</td>
<td>(0.772–0.872)**</td>
<td>(0.698–0.903)</td>
<td>0.946</td>
<td>0.953</td>
<td>0.575</td>
</tr>
<tr>
<td>Authenticity</td>
<td>4</td>
<td>(0.872–0.946)**</td>
<td>(0.810–0.962)</td>
<td>0.942</td>
<td>0.958</td>
<td>0.852</td>
</tr>
<tr>
<td>Responsibility</td>
<td>4</td>
<td>(0.736–0.916)**</td>
<td>(0.645–0.942)</td>
<td>0.885</td>
<td>0.922</td>
<td>0.749</td>
</tr>
<tr>
<td>Openness</td>
<td>4</td>
<td>(0.863–0.951)**</td>
<td>(0.819–0.964)</td>
<td>0.937</td>
<td>0.955</td>
<td>0.842</td>
</tr>
<tr>
<td>Competence</td>
<td>3</td>
<td>(0.921–0.927)**</td>
<td>(0.894–0.946)</td>
<td>0.914</td>
<td>0.946</td>
<td>0.853</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>3</td>
<td>(0.874–0.932)**</td>
<td>(0.796–0.953)</td>
<td>0.893</td>
<td>0.934</td>
<td>0.825</td>
</tr>
<tr>
<td>Perceived</td>
<td>6</td>
<td>(765–0.825)**</td>
<td>(0.653–0.881)</td>
<td>0.881</td>
<td>0.910</td>
<td>0.626</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental impact</th>
<th>Items</th>
<th>Factor loading</th>
<th>Bootstrap confidence intervals</th>
<th>CA</th>
<th>CR</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived risk</td>
<td>5</td>
<td>(0.790–0.892)**</td>
<td>(0.793–0.847)</td>
<td>0.821</td>
<td>0.876</td>
<td>0.586</td>
</tr>
<tr>
<td>Service provision risk</td>
<td>2</td>
<td>(0.944–0.952)**</td>
<td>(0.901–0.979)</td>
<td>0.888</td>
<td>0.947</td>
<td>0.899</td>
</tr>
<tr>
<td>Supplier selection risk</td>
<td>3</td>
<td>(0.824–0.905)**</td>
<td>(0.705–0.949)</td>
<td>0.840</td>
<td>0.903</td>
<td>0.757</td>
</tr>
<tr>
<td>Propensity to trust</td>
<td>5</td>
<td>(0.733–0.863)**</td>
<td>(0.614–0.898)</td>
<td>0.859</td>
<td>0.888</td>
<td>0.639</td>
</tr>
<tr>
<td>Loyalty</td>
<td>6</td>
<td>(0.720–0.865)**</td>
<td>(0.627–0.899)</td>
<td>0.895</td>
<td>0.920</td>
<td>0.657</td>
</tr>
</tbody>
</table>

| Notes: ***p < 0.01 |
| Source: Authors’ own creation |

Model proposition for energy markets
<table>
<thead>
<tr>
<th>Construct/dimension (items)</th>
<th>Trust</th>
<th>Satisfaction</th>
<th>Peimpact</th>
<th>Prisk</th>
<th>Protrust</th>
<th>Loyalty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust (15 items)</td>
<td>0.646–0.836</td>
<td>0.259–0.544</td>
<td>0.280–0.588</td>
<td>−0.399 to −0.180</td>
<td>0.096–0.275</td>
<td>0.284–0.524</td>
</tr>
<tr>
<td>Satisfaction (three items)</td>
<td>0.403–0.444</td>
<td>0.874–0.932</td>
<td>0.510–0.577</td>
<td>−0.363 to −0.292</td>
<td>0.016–0.090</td>
<td>0.483–0.566</td>
</tr>
<tr>
<td>Perceived environmental impact (six items)</td>
<td>0.387–0.467</td>
<td>0.427–0.528</td>
<td>0.765–0.825</td>
<td>−0.360 to −0.133</td>
<td>0.071–0.235</td>
<td>0.366–0.444</td>
</tr>
<tr>
<td>Perceived risk (five items)</td>
<td>−0.348 to −0.225</td>
<td>−0.325 to −0.205</td>
<td>−0.368 to 0.151</td>
<td>0.007–0.848</td>
<td>−0.103 to −0.032</td>
<td>−0.265 to −0.192</td>
</tr>
<tr>
<td>Propensity to trust (five items)</td>
<td>0.160–0.275</td>
<td>0.010–0.088</td>
<td>0.103–0.196</td>
<td>−0.118 to −0.042</td>
<td>0.733–0.863</td>
<td>0.122–0.218</td>
</tr>
<tr>
<td>Loyalty (six items)</td>
<td>0.406–0.516</td>
<td>0.363–0.539</td>
<td>0.310–0.523</td>
<td>−0.356 to −0.186</td>
<td>0.111–0.259</td>
<td>0.720–0.865</td>
</tr>
</tbody>
</table>

Source: Authors' own creation
closely followed by Perceived environmental impact (4.262), Loyalty (4.184) and Trust (3.930). The variable Propensity to trust has a mean of 3.140 over 5 points, and the lowest mean is that of the Perceived risk (1.286).

4.2 Structural model
The proposed hypotheses in the structural model were tested through a SEM procedure, attending to the recommendations of Hair et al. (2019a), 2019b, 2019c. A total of four tests were deployed. Firstly, to assess collinearity in the model the variance inflation factor (VIF) coefficients were calculated. Secondly, the explanatory power of the model in the sample is analysed to obtain the loyalty construct coefficient of determination ($R^2$). Thirdly, the predictive power of the model out of the sample is tested using the $Q^2$ value, obtained through a blindfolding procedure and the $Q^2$ value derived from PLSpredict. Fourthly, the size and statistical significance of the effects among variables as the $f$ parameters were calculated. To guarantee results, the PLS with bootstrapping was used (5,000 samples and 95% of confidence level).

Results obtained for the VIF coefficients show ideal values (Hair et al., 2019a), 2019b, 2019c), and the absence of collinearity between the variables in the model is demonstrated (Table 7). The $R^2$ coefficient achieves 43.50% (Table 8), a value that widely exceeds the 10% threshold recommended by Falk and Miller (1992); it confirms the predictive value of the model in the sample. Also, the out-of-sample predictive value is demonstrated by exceeding zero (Hair et al., 2019a), 2019b, 2019c), both for the $Q^2$ of Stone-Geisser 0.260 and the $Q^2$ obtained with the PLSpredict procedure 0.159 (Shmueli et al., 2016). Those results suggest a good model (Hair et al., 2019a), 2019b, 2019c).

The analysis of the standardised coefficients and their significance, and the value of $f^2$ parameters (Table 8) confirm all hypotheses proposed in the model. The direct relationships between Trust ($H1$) and Satisfaction ($H2$) with Loyalty are demonstrated. Furthermore, the indirect relationships between Propensity to trust ($H6$), Perceived risk ($H5$) and Perceived environmental impact ($H4b$) over Loyalty mediated by Trust, and the influence of Perceived environmental impact over Loyalty mediated by Satisfaction and jointly by Satisfaction and Trust ($H4a$ and $H3$). The sign of relationships is the expected, only negative for Perceived risk.

Regarding the importance for loyalty, Satisfaction shows the highest effect on Loyalty (0.471), followed by Perceived environmental impact (0.412) and Trust (0.380). The other variables have substantially less influence: $-0.056$ for Perceived risk and 0.068 for Propensity to trust.

5. Discussion
This research develops a loyalty model for green electricity providers. Results suggest a good explanatory power of customer loyalty from the integration of three main elements: satisfaction, perceived environmental impact and trust. These findings not only contribute

<table>
<thead>
<tr>
<th>Construct/Statistics</th>
<th>Trust</th>
<th>Satisfaction</th>
<th>Perceived environmental impact</th>
<th>Perceived risk</th>
<th>Propensity to trust</th>
<th>Loyalty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.930</td>
<td>4.563</td>
<td>4.262</td>
<td>1.286</td>
<td>3.140</td>
<td>4.184</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>0.844</td>
<td>0.727</td>
<td>0.865</td>
<td>0.627</td>
<td>1.009</td>
<td>0.978</td>
</tr>
</tbody>
</table>

Source: Authors’ own creation

Table 7. Descriptive statistics of the scales (mean and standard deviation)
Table 8: Hypotheses testing

<table>
<thead>
<tr>
<th></th>
<th>Trust</th>
<th>Satisfaction</th>
<th>Loyalty</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standardised coefficients (Confidence intervals)</td>
<td>Standardised coefficients (Confidence intervals)</td>
<td>Standardised coefficients (Confidence intervals)</td>
</tr>
<tr>
<td></td>
<td>VIF</td>
<td>Direct effects</td>
<td>Indirect effects</td>
</tr>
<tr>
<td>Trust</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.66</td>
<td>0.138***</td>
<td>0.198***</td>
</tr>
<tr>
<td>Satisfaction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.727</td>
<td>0.239***</td>
<td>0.121***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.184–0.490)</td>
<td>(0.057–0.201)</td>
</tr>
<tr>
<td>Perceived environmental impact</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived risk</td>
<td>1.265</td>
<td>-0.148**</td>
<td>-0.148**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-0.306 to</td>
<td>(-0.306 to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.010)</td>
<td>-0.010)</td>
</tr>
<tr>
<td>Propensity to trust</td>
<td>1.046</td>
<td>0.186***</td>
<td>0.289***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.085–0.284)</td>
<td>(0.085–0.284)</td>
</tr>
</tbody>
</table>

Notes: Direct, indirect and total effects (bootstrap results). $R^2$ (Loyalty) = 0.435, $Q^2$ (Loyalty) = 0.369, ***p < 0.01, **p < 0.05 and *p < 0.1.
Source: Authors' own creation.
to the better understanding of trust in credence goods and continuous purchasing situations but also offer implications to strengthen consumer trust for managers at green electricity providers. It is a major challenge to better understand those consumers interested in buying green products (Skordoulis et al., 2020). Particularly, in the dynamic environment of green electricity markets, trust and satisfaction are focal elements for building long-term customer relationships. While customers cannot directly evaluate the “green characteristic” of electricity, providers may leverage trust and foster satisfaction. Additionally, they should generate consumer confidence in the positive environmental effects of their activities (Akroursh et al., 2019). Those actions are important in a context where credence qualities and continuous buying behaviours are relevant.

From a theoretical point of view, the integrative theoretical model shows an interesting explanatory power, providing a series of implications. Firstly, it confirms trust as a core antecedent in the continuity and development of relationships (Chaudhuri and Holbrook, 2001; Delgado and Munuera, 2005; Morgan and Hunt, 1994). Although previous research found trust to be a more influential antecedent of loyalty than customer satisfaction towards the energy provider (Apaolaza-Ibáñez et al., 2006), this research suggests that both are important as they are significant and show an important effect on loyalty, favouring the indirect effects of other antecedents on loyalty. Secondly, service dissatisfaction is considered a major driver to change the provider (Pascual-Nebreda et al., 2023), and it also works for energy providers (Walsh et al., 2006); in this case, for green electricity consumers. Thirdly, the satisfaction-trust relationship is confirmed for a green market environment, following a similar line with previous studies on electricity markets (Bakay and Schwaiger, 2006; Drosos et al., 2020). Fourthly, the perceived environmental impact plays a central role in the model to anticipate green consumer loyalty by an indirect effect through trust and satisfaction. The relationship between perceived environmental impact and trust substantiates previous arguments (Chen and Chang, 2012; Mezger et al., 2020b). Regarding the relationship between perceived environmental impact and satisfaction, it is confirmed for consumer markets and green buying contexts. Perceived positive environmental impact becomes a clear driver of a positive and long-term relationship between suppliers and customers (Chen and Chang, 2012, 2013). Fifthly, although propensity to trust and perceived risk are significant, as the sample includes current green customers, their direct effects on loyalty are low. Sixth, the application of Oliver’s (1997, 1999) proposition perfectly fits with this model, and the cognitive variables are mediated by affective and conative variables to achieve loyalty (Fishbein and Ajzen, 1975). It provides an integrative approach to theoretically understand loyalty, including multiple perspectives that open a few managerial implications.

From a managerial point of view, the overarching model proposed shows a high explanatory power of loyalty (43.50%) with a strong influence of three variables. It reveals that green electricity providers should leverage trust, manage satisfaction and work on the perceived environmental impact to improve customer relationship management. The marketing efforts to retain customers should be around those issues. The high coefficient of Satisfaction (0.471) suggests that companies should periodically review customer satisfaction to identify strengths and weaknesses. Similarly, the Environmental impact perception is also core in explaining loyalty (0.412). Marketing measures and communication messages should focus on delivering details and insights about these impacts in transparent ways (Akroursh et al., 2019). Information about CO₂ savings, the periodic information about electricity sources and press releases about ongoing projects to build new green energy production sites are some examples. This action will also increase the level of trust in the green electricity supplier; the combination of external references combined with internal
communication and advertising campaigns will allow electricity providers to strategically enhance their ethical concerns about the environment and favour loyalty. This is a very effective alternative to differentiate firms working in a continuous purchasing setting, characterised by low involvement of customers, such as that for electricity.

However, the paper presents some limitations that can open future research lines. Firstly, this study develops a specifically tailored conceptualisation of the model constructs in green electricity providers. While these limits the immediate transfer of the construct to other market contexts, it provides a starting point for research into the stability of the construct for other industries with similar market characteristics (e.g. telephone or gas services). A second limitation lies in the selection of antecedents of loyalty. Previous literature includes commitment as a key variable of loyalty, showing an important mediating effect (between trust and loyalty) regarding environmental issues or willingness to pay for green offerings (Garbarino and Johnson, 1999; Morgan and Hunt, 1994); its inclusion can thus improve the explanatory power of the model. Firm performance indicators such as market share or firm profitability could be considered in the model. Thirdly, the sample used for this study is restricted to German consumers. Future studies should assess the model with data samples from other countries and cultures as consumer behaviour is highly dependent on cultural norms, values and perceptions (Blackwell et al., 2006; Solomom, 2011). Furthermore, German society has a long tradition of environmental protection measures in private households (e.g. separate disposal of waste since 1980s) and the political decision to enforce the “Energiewende” (energy transition) since 2011. Further work should elaborate on this influence and potential differences compared to other (European) societies.

References


Further reading


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Pablo Cabanelas is an Assistant Professor of Marketing and the Director of the master’s course in International Commerce at the University of Vigo (Spain). He also belongs to the UNAM (México) faculty in the post-graduate studies. His current research interests are competitiveness, industrial marketing and relationship marketing. He has participated in several research projects with different regional and national institutions and companies. His research has been published in several books and journals such as *Industrial Marketing Management*, *Journal of Business Research*, *Journal of Business and Industrial Marketing*, *Business Strategy and the Environment* and *Regional Studies* among others.

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