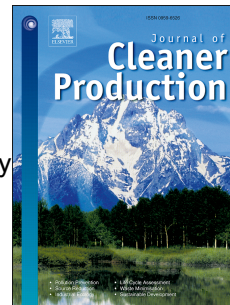# Journal Pre-proof

What does it matter for trust of green consumers? An application to German electricity market

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WHAT DOES IT MATTER FOR TRUST OF GREEN CONSUMERS? AN APPLICATION TO GERMAN ELECTRICITY MARKET.

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WHAT DOES IT MATTER FOR TRUST OF GREEN CONSUMERS? AN APPLICATION TO GERMAN ELECTRICITY MARKET.

Abstract:

The concerns about environment and the social dynamics of markets are favouring the consumption of green products. As the main associations to green products are based on intangible factors, trust in the supplier firms becomes central. However, trust is not an easy construct and its measurement is particularly complex in such a context as green consumption. This paper contributes to literature developing a model to measure trust of green consumers. After a theoretical review about the conceptualization and measurement of trust and the application of an exploratory factorial analysis in two samples of consumers regarding green electricity in Germany, the results identify four dimensions influencing trust: competence, responsibility, openness and authenticity. It opens opportunities for both academics and managers about how to measure trust and what managerial practices can reinforce their environmental-friendly products or services offerings.

1. Introduction

During last decades, customers have changed their behaviours due to their higher environmental concerns (Laroche et al., 2001; Brody et al., 2012). It favours a modification of their purchase decisions through the consumption of eco-friendly alternatives (Paco and Rapose, 2009; Chen and Tung, 2014). As a consequence, a growing number of customers are looking for green products, those "products (tangible or intangible) that minimize their environmental impact (direct and indirect) during their whole life cycle, subject to the present technological and scientific status" (Sdrolia and Zarotiadis, 2019; p.164), and are ready for paying more for them (Kahn, 2007; Laroche et al., 2001).

Among those environmental concerns, climate change impacts are achieving a central position (Chen, 2016). In the climate change scenario, the reduction of fossil fuels consumption and the increase of renewable energies are becoming two challenging tasks (Halder et al., 2016). As their mitigation is closely linked to energy consumption, there exist a strong movement on energy that it is encouraging firms and technicians to improve sustainable energy technologies (Muraca and Neuber, 2018) and clients to sign with those companies that obtain their energy from renewable sources (Hall and Roelich, 2016; Hentschel et al., 2018). Therefore, many consumers are interested in modifying their consumption behaviour, with less impact on natural resources, particularly on fossil fuels (Chen, 2016). The social dynamics are thus contributing to the development of green energy (Alam et al., 2014), since customers in the energy market are committed with environmental protection through green electricity (Strupeit, and Palm, 2016). Thus, the atmospheric consequences of carbon-fired power plants (e.g. smog) and global warming are favouring the development of a worldwide green energy industry (Rowlands et al., 2002).

Furthermore, as the liberalization of electricity markets allows for an increasing competition and supplying alternatives, many customers do not only ask how much electricity is consumed and at what price, but also how electricity is generated (Rowlands et. al, 2002). The green electricity, understood as electricity entirely generated from renewable energy sources with low impact on the environment (Kotchen and Moore, 2007; Rowlands et al., 2002; Salmela and Varho, 2006), became a real alternative.

On this topics, previous studies have detected significantly positive associations between general environmental protection attitudes and willingness to switching to a green electricity supplier (Bang et al., 2000; Arkesteijn and Oerlemans, 2005; Hansla et al., 2008). Different authors suggested a direct relationship between trust and intention to switch towards new consumption experiences (Garbarino and Johnson, 1999) and found that the more users who trust a given supplier, the higher the adoption rate (Bhattacherjee, 2002; Arkesteijn and Oerlemans, 2005). Due to these relationships and the complex nature of trust, many authors intended to conceptualize and measure trust through different approaches. From these studies two main approaches emerge: the single-factor approach (single item or multi-item) and the multiple-factor models. Studies using a single-factor approach assume that the construct consists of one factor that describe only the level of trust (Selnes, 1998; Rampl et al., 2012), without including specific factors underlying a more complex theoretical construct of trust. Other studies apply multi-item scales to measure trust. Hence, the trust construct is described by a first-order factor defined by items covering different dimensions (Sirdeshmukh et al., 2002; Chen & Chang, 2012). On the other hand, multiple-factor models define trust as second-order construct. In these models, trust is built by several first-order constructs. Each of these factors has several items that describe different components of the construct. Indeed, in previous attempts, some authors have assessed trust based on the competence (Davies et al., 2011; Park et al., 2012) or the ability (Casaló et al., 2010; Okazaki et al., 2009) a firm has to

perform a certain activity. But also on the dependability (Delgado-Ballester et al., 2003; Garbarino and Johnson, 1999) and confidence in quality and reliability (Delgado-Ballester et al., 2003; Garbarino and Johnson, 1999) a firm can generate on their customers. Moreover, some studies included an affective and emotional dimension conceptualised by factors such as sympathy (Hawes et al., 1989) and benevolence (Casaló et al., 2010; Park et al., 2012). Additionally, others use the factors responsibility (Hawes et al., 1989; Swan et al., 1988), altruism, customer orientation (Chen, 2012; Sun and Lin, 2010) and integrity (Albert and Merunka, 2013; Chen, 2012; Davies et al., 2011) when performing their purposes to measure trust.

Despite previous contributions offered interesting insights and dimensions to understanding factors impacting consumers' trust, they did not reveal comprehensive approach to capture the entire scope and complexity of the phenomenon of trust, neither to specifically address the measurement of trust in green energy suppliers. Further, the literature review also revealed no existing research on trust in electricity suppliers. Although there are studies in industries such as fixed-line telephones and life insurance, both of which have similarities with the electricity industry (low involvement of customers and difficult to differentiate and highly complex products that requires high credence equalities), electricity markets differ from other industries because of product characteristics. For example, electricity is intangible, and consumers cannot verify product characteristics before, during or even after purchase and consumers may be unsure about the credibility of suppliers and product characteristics.

Therefore, this research intends to cover this gap by providing, firstly, a comprehensive approach to capture the complexity of the phenomenon of trust, secondly, developing a new measurement model of trust for green consumers through a multi-dimensional approach. In order to achieve this objective, it is deployed a systematic literature review, two surveys and two different focus groups, and an exploratory factor analysis in Germany. This approach allows for identifying a series of constructs that characterise trust in green electricity markets. Thus, this paper provides a consistent contribution to the literature on consumer trust regarding its measurement, with the novelty of including a specific approach to those consumers more committed to green behaviour.

The paper is organized as follows, the first section deals with the conceptualization and different alternatives to measure trust as a factor influencing customer behaviours. The second section explains the methodology, including the context of the research, the research approach, the sampling and data collection, and the analysis. The third outlines the results and constructs obtained. Finally, it is provided a brief discussion of results, and the implications and future research.

2. Literature review

2.1. Research on trust: towards green trust.

Trust is a ubiquitous and multifaceted phenomenon, researched in academic disciplines like philosophy (Neumann, 2006), psychology (Deutsch, 1960; Rotter, 1967), sociology and economics (McKnight & Chervany, 2001). In the area of management and marketing, the initial studies focused on interpersonal relationships between buyers and sellers (Crosby et al., 1990) and business-to-business relationships (Moorman et al., 1993). But the emergence of relationship marketing literature embedded trust in a broader framework including business-to-consumers relationships (Morgan and Hunt, 1994). This stream of marketing emphasizes trust as a central element for long lasting relationships with profitable customers (Doney and

Cannon, 1997; Moorman et al., 1993; Morgan and Hunt, 1994). In words of Berry (1995, p.242) trust is "the single most powerful relationship marketing tool available to a company".

Although the research on trust between firms and final customers relationships has been somewhat neglected in the past (Lee and Turban, 2001), in recent years there exists a high interest by academics (Kenning, 2008). This research field evaluates existing or potential relationship between buyer and seller, agreeing that consumers only choose vendors that enjoy a high degree of trust. Because of the omnipresence of trust, it is impossible to develop one general definition that is appropriate in all research contexts (Hosmer, 1995). Accordingly, there is no consistent understanding of trust within academic disciplines, and it is defined in different ways (McKnight and Chervany, 2001).

In the context of green products, namely organic food, sustainable tourism, renewable energy, among others, the term 'green trust' is defined as "a willingness to depend on a product, service, or brand based on the belief or expectation resulting from its credibility, benevolence, and ability about its environmental performance" (Chen 2010, p. 309); it is a belief about the environmental performance of such products (Chen and Chang, 2013). Overall, green trust is driven by the environmental friendliness of products and services that is recognised by consumers. In such cases, consumers consider that those 'green characteristics' contribute to increase quality, lower perceived risk and increase overall satisfaction (Chen, 2010; Chen and Chang, 2012; Chen and Chang, 2013). Previous studies found that lack of consumer trust and confidence in green claims and, also, the characteristics of green products were significant barriers to purchase green products (Bang et al., 2000; Gupta and Ogden, 2009; Vermeir and Verbeke, 2008; Chen et al., 2012). These findings comprise a core aspect of the trust construct and related antecedents for the green electricity market.

2.2. On the conceptualization of trust: literature analysis results.

As trust becomes an attitude or expectation, and also relies in specific characteristics, its conceptualization requires different models according to its research context (Kenning and Blut, 2006). In the literature on trust different approaches to measure trust can be found, some of them are single-factor, including single-item or multi-item scales, but the complexity of the construct favoured the apparition of multi-factor measurements.

Among the single-item approaches, Selnes (1998) operationalised trust in business relationships as a single item evaluated on a ten-point scale. Rampl et al.'s (2012) studied consumer trust in food retailers also using a single-item measurement, asking participants how much they trust in a specific retailer. However this approach was not much used in literature because it can restrict the measurement of trust to very simple constructs (Hair Jr. et al., 2006).

The multi-item approach was more used for analysing trust. Crosby et al. (1990) used nine items to measure trust for life insurance customers (e.g. reliability, trustworthiness, dishonesty and focus on customer interests). Ranaweera and Prabhu (2003) identified the influence of trust as a determinant of customer retention and word of mouth using a three-item scale adapted from Morgan and Hunt (1994). Further studies are Anderson and Narus (1990) and Dahlstrom and Nygaard (1995). Although these approaches achieve generally good reliability values, they do not accomplish sufficient degrees of external validity to represent trust in all facets.

Additional studies on single-factors approaches used multi-items scales but differentiating dimensions of the construct trust. Moormann et al. (1993) operationalised trust with five items, related to the dimensions of credibility and benevolence. Doney and Canon (1997)

assessed trust of manufacturing companies in their supplier firms (eight items) and salespeople (seven items) as two independent constructs, conceptualising trust as a single-factor approach consisting on the dimensions of credibility and benevolence. Sirdeshmukh et al. (2002) e differentiated between trust in frontline employees and in management policies and practices, distinguishing two constructs of trustworthiness (individual attitude) and trust (four items covering dependability, competence, integrity and responsiveness). More recently, Chen's approaches towards green trust leverage single-factor, multiple-item measurement models of trust (Chen, 2010; Chen and Chang, 2012; Chen et al., 2015). The items comprise reliability, dependability, trustworthiness as well as accomplishment of expectations. The 2010 and 2012 studies include a fifth item emphasizing environmental protection as a specific dimension of green trust: 'This product keeps promises and commitments for environmental protection'. Meanwhile, Kikuchi-Uehara et al. (2016a) include social values to understand the attitude towards the environmental information of products, distinguishing two types of dimensions: scientific support and fairness in the eco-labelling certification, and effectiveness in the environmental impact reduction and corporate consciousness on promoting environmental protection. Later, Kikuchi-Uehara et al. (2016b) simplify the factors of trust on information sources in two dimensions, competence –perception of how institutions or individuals are knowledgeable and competent technically in a defined area– and trustworthiness –affective perceptions of those source of information.

Other conceptual approaches emphasise trust as a multi-factor construct (Rempel et al., 1985; Zaheer et al., 1998). This research stream focuses on the conceptualisation and operationalisation of trust instead of the explanation of relationships, antecedents and consequences of trust, achieving a stronger theoretical and methodological foundation with a higher level of validity. The first adopters were Swan et al. (1988) and Hawes et al. (1989). The recent literature has deepened on this approach. Thus, Bhattacherjee (2002) evaluated consumer trust in the electronic commerce context using ability, benevolence and integrity as factors. Delgado-Ballester et al. (2003) measured trust in brands conceptualising it as a construct with two factors: reliability (altruism, benevolence, honesty, dependability and fairness) and intention (altruism, benevolence, honesty, dependability and fairness). Meanwhile Okazaki et al. (2009) use three factors, ability, benevolence and integrity to analyse consumer privacy concerns in the Japanese mobile phone market. Casaló et al. (2010) conceptualize trust in online communities and retailers based on the three factors (honesty, benevolence and ability) with three items per factor. Davies et al. (2011) understand trust based on two factors, integrity and competence (three items each), while satisfaction and conflict represent antecedents of trust and compliance a consequence of trust. Finally, Park et al. (2012) built on a multi-dimensional model of trust in online retailers based on three dimensions: competence (four items), benevolence (three items) and integrity (four items).

Therefore, previous literature does not capture the large scope of trust, specifically for such particular context as green electricity. Thus, it is necessary to develop a specific model to measure trust in green electricity markets.

3. Methodology and analysis

3.1. Contextualization: The German market of green electricity

In the past the German electricity market was regulated by the country's energy law of 1935: the energy market was legally exempt from competition. Energy suppliers had regional monopolies, and the prices were high due to this market structure; energy companies had no incentive to reduce electricity generation costs neither to introduce value-added services. Once the European Commission decided to create a liberalised market, introducing changes in

the European law, and consequently in the German law too, the opening of the German market became a reality. Today about 1,000 suppliers of electricity for end consumers are offering about 10,000 different tariffs –including green tariffs. On average, consumers can choose between 85 suppliers in a single postcode area. Now it is possible to contract the new electricity supplier with only one mouse click. In addition, the German government introduced the so called "Energiewende" (energy transition) in 2010. In this transition, the Renewable Energy Sources Act (EEG) pursues substitute fossil fuels and nuclear energy. It included a series of measures to encourage the generation of renewable electricity were the guaranteed grid connection, priority feed-in guaranty, and a government-set feed-in tariff for 20 years. It meant a high incentive to invest in new plants for the generation of renewable electricity. The scheme is funded by a surcharge on electricity consumers. For 2017, the unabated EEG surcharge was 6.88 ¢/kWh. The Renewable Energy Sources Act reflects the increasing consumer´s concerns about environmental issues (e. g. smog and global warming as a consequence of carbon-fired power plant). As a result, a higher number of customers are looking for green products.

Under these circumstances, Germany becomes a pioneer country in the development of green electricity. As reflected in table 1, in 2017 the 33.3% of the energy produced in Germany came from renewable sources, with a subsequent increasing from 17,000 GWh in 1990 to 216,375 GWh in 2017 (BMU, 2018). The predominant renewable energy sources are wind energy and biomass, which account for more than 70% of renewable electricity production in 2017 (BMU, 2018). Particularly, wind power and photovoltaic have shown extremely dynamic growth rates in recent years. In 2017, Germany had the highest installed wind-power capacity in Europe (55,873 MW). Hydropower, previously the main source of renewable energy in Germany remain stable since 1990 while the others grow.

Table 1: Gross electricity production in Germany in billion kWh

	1991	1995	2000	2005	2010	2015	2017
Overall electricity production	540	537	577	623	633	648	655
Production of renewable sources	17	25	38	63	105	189	218
%	3.1%	4.7%	6.6%	10.1%	16.6%	29.2%	33.3%

Sources: BDEW, 2018a; BDEW, 2018b.

This increase is a consequence of new regulations implemented by the government (Wüstenhagen and Bilharz, 2006) coupled with consumers' awareness in environmental issues (Rowlands et al., 2002). Suppliers of green electricity products can be divided into the following three groups:

- Electricity groups (vertically integrated companies) with their own green electricity brands. This category includes large nationwide green electricity suppliers participating with large superregional (vertically integrated) suppliers.

- New nationwide suppliers, independent from the four well-established and vertically integrated companies. These suppliers have not been previously involved in electricity generation and exclusively offer green electricity products (Rohracher, 2009; Wüstenhagen and Bilharz, 2006); they are not connected with nuclear or coal-fired power stations, their products are 100% green electricity.

- Local green electricity suppliers, from a regional or municipal area.

Therefore, the green electricity market has some differential characteristics in its dynamics due to its recent-born status. Particularly, the emergence of new green electricity products,

mainly from small newly established providers, and the lack of reputed brands with a long-term history in the electricity market.

3.2. Empirical analysis

The development of a measurement model for the theoretical construct of consumer trust can be achieved by surveying a set of relevant perceived characteristics of a company (Homburg and Giering, 1996). This process took different nested steps.

4.2.1 Generation of item list

In order to extract and identify previously used items from the existing literature on consumer trust in (green) electricity providers, a list of items containing non-context specific (i.e. non-industry, no country, non-time context specific) was created. This step followed the approach suggested for David and Han (2004), searching for public academic articles in comprehensive academic databases, including a comprehensive key word search (consumer and trust*) with additional keywords (to eliminate references), selecting only those documents with empirical content and with high relevance for the topic. From the database Business Source Elite, a total of 600 papers were collected and 99 were analysed in depth (those substantive articles in the topic analysed and with empirical relevance as our aim is measuring trust). The first list comprised 42 measurable characteristics of electricity providers associated with the notion of trust. In a second step, the items from literature review were expanded by adding synonyms for the terms. This allowed for controlling personality and context-related differences of understanding and daily use of the adjectives. The existing list was expanded by 69 synonyms, resulting in 111 items. The third phase intended to achieve a deeper empirical understanding of the trust construct in the context of green electricity. Qualitative interviews were conducted with executive MBA students (n=31) between October and November 2012. All interviewees had signed an electricity contract for their rented or owned flat within the previous five years. A total of 39 additional items resulted from this analysis. The list was expanded to a total of 150 items (see appendix A) and it became the basis for the creation of a new model to measure trust in electricity markets.

4.2.2 Survey to reduce item list

The second step was a survey to reduce the initial number of items (see appendix A) and removing items with low understandability and relevance (Homburg and Giering, 1996). This step was important to avoid inappropriate items that would limit further analysis (Homburg and Giering, 1996) and because the list of items should be manageable.

The survey was conducted through additional interviews with 16 electricity consumers in a convenience sample. The number of interviews was significantly higher than pre-test participants in similar studies (Bhattacherjee, 2002). These interviews were conducted in person or by phone between February and April 2013. The interviewees were between 26 and 60 years old with an average of 35.6 years, and 44% were male and 56% were female.

The interviews focused on the participants' personal understanding and characterisation of trust in electricity suppliers. First, participants were asked to describe characteristics of electricity suppliers they trust, which were compared to characteristics on the initial list; all adjectives suggested by participants were already in the list, indicating the comprehensiveness of the initial 150-item list. In the second part of the interviews, the participants were asked to

evaluate all 150 items in terms of (1) how well the items fit with everyday language use and (2) if the item adequately characterised their trust in electricity suppliers using a five-point Likert scale (1= totally disagree, 5= totally agree). For both criteria were calculated the means of all items. Subsequently, items with a mean equal to or lower than 3.0 for both criteria were eliminated, leaving 58 items (bold words in appendix A).

4.2.3 Data collection and sample

An empirical online survey was conducted between the end of May and the beginning of October 2013[1] (see appendix B). The questionnaire had two main parts. First, a short introduction outlining the study and questions related to personal data (demographics) and about the electricity supplier (i.e., name, type of tariff, if and how often the respondents switched suppliers). Second, questions to evaluate their electricity supplier according to the 58 characteristics from the preliminary analysis, using a five-point Likert scale (1= totally disagree, 5= totally agree). A total of 353 respondents participated in the survey, but due to missing values in 49 questionnaires, the final sample was 304 participants. According to Hair Jr. (2006), a sample must have more observations than variables; the minimum of observations should be more than 50 and preferably more than 100, and 10 observations for each variable are needed for analysis up to a total sample size of 300. Hence, the sample size of this study including 304 respondents is adequate for the exploratory factor analysis. Table 2 reflects the description of the sample, including its comparison with German population.

Additionally, a control for the measurement model to realize whether the model shows consistent results was made in a different time interval, through a written survey in a small town in Germany. It took between October and December 2014. The questionnaire was based on the preliminary results of the model, but questions, data collection and analysis proceedings were adapted from the initial online survey. The control sample included 85 participants whose characteristics are shown in table 2.

Table 2: Samples descriptive analysis

Sample 1		Survey		German population
		Frequency	%	%
Gender	Male	175	57.6	49.1*
	Female	129	42.4	50.9*
Age	under 30	72	23.7	30.6*
	30-49	180	59.2	28.5*
	50-64	46	15.1	20.4*
	over 64	4	1.3	20.6*
Electricity supplier	General	275	90.5	88.3
	Pure green	29	9.5	11.7 **
Sample 2		Town		German population
		Frequency	%	%
Gender	Male		51	49.1***
	Female		49	50.9***
Age	under 30		29.1	30.6***
	30-49		28.5	28.5***
	50-64		20.4	20.4***
	over 64		20.6	20.6***

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[1] Throughout the long data collection period a constant intake of responses was recorded, showing no indication of multiple response waves.

| Electricity supplier | General | 79 | 93.0 | 88.3 |
| | Pure green | 6 | 7.0 | 11.7** |

Sources: * Destatis (2013); ** Bundesnetzagentur (2013); *** Statistisches Landesamt Baden-Württemberg (2014)

4.2.4 *Quantitative analysis*

The analysis applied was an exploratory factor analysis (EFA). It is a method used when there is no theory about the relationship between items and their respective dimensions (Gerbing & Anderson, 1988). To the stent the literature review revealed no approach to measuring consumer trust that it is applicable for trust in electricity suppliers. Particularly, the choice of EFA was based on the structure of the data and the specific research situation because it was necessary to develop a new model. EFA offers a method of data summarisation and reduction (Hair Jr. et al., 2006). The concept behind data summarisation is the identification and definition of structure within a dataset (Stewart, 1981) and the suggestion of dimensions (Churchill Jr., 1979). Furthermore, EFA condenses and reduce the number of items to a manageable dataset (Gerbing & Anderson, 1988; Hair Jr. et al., 2006; Stewart, 1981) while minimizing loss of information (Hair Jr. et al., 2006). Thus, EFA let scale construction (Gerbing & Anderson, 1988).

The first step for the EFA included the analysis of the dataset applying Kaiser-Meyer-Olkin (KMO) criterion and Bartlett's test to assess normality. Next, the method of factor extraction was used to determine the number of factors through principal component analysis. Due to multidimensional nature of trust and the identification of independent factors in previous models, the varimax rotation was carried out to interpret factors. Finally, the reliability and validity of the model was evaluated through first and second generation methods, including coefficient alpha, maximum likelihood estimation and standardised regression weighs.

4. Results

4.1. Analysis of data sets and derivation of underlying factors.

The application of KMO showed good results with .954 and .854 respectively in each sample. Bartlett's test offered good values with a significance level of .000 in both samples. The sample is thus appropriate to develop a factor analysis. The principal component analysis showed that nine factors had eigenvalues higher than one, with a total explained variance of 71.872 percent (appendix C – table 1). This high number of factors does not meet the requirements for a compact, manageable model. Evaluating the communalities after extraction, the average is .719 while most (except for five items) are >.6 (appendix C – table 2). This indicates a high proportion of shared variance and, thus, a well-suited amount of variance that is explained by the retained factors.

Since this study includes many items, strict criteria were followed for item selection. To achieve lower complexity and a well-designed structure, Hair Jr. et al.'s (2006) suggestions were applied. All items with values lower than .7 were eliminated, reducing the list to 24 items. Based on initial component analysis, the items 'local', 'regional' and 'national' were grouped together as one factor. The item 'national' had a negative factor loading of -.534. Although the items, 'local' and 'regional', had relatively high factor loadings (regional=.813, local=.875), but they did add value for measuring trust. After these reductions, 21 items remained and were the bases to carry out again an exploratory factor analysis resulting in four factors with total explained variance of 75.32 percent (table 3). The rotated factor solution

provided meaningful factors, with a similar distribution of the explained total variance, without strong emphasis on any of them as reflects table 3. Finally, the items 'can be counted on' and 'dependable' were deleted because of their low loadings on factor two and high cross-loadings with factor four (.486 and.515). The rotated factor matrix resulted in four factors.

Table 3: Rotated Factor Matrix (21 items) and quality criteria (sample 1).

	Factor			
	1	**2**	**3**	**4**
Green	.893			
Sustainable	.887			
Ecologically worthwhile	.879			
Environmentally responsible	.849			
Environmentally sound	.848			
Environmentally aware	.828			
Renewable	.821			
Honest		.826		
Sincere		.795		
Trustworthy		.793		
Reliable		.792		
Can be counted on		.552		.486
Dependable		.526		.515
Approachable			.868	
Accessible			.855	
Customer oriented			.766	
Service oriented			.753	
Experienced				.786
Well-known				.677
Expert				.650
Knowledgeable				.640
Quality Criteria				
Total Variance %	27.430	19.392	15.651	12.845
Coefficient alpha	.955	.913	.922	.753

Extraction: Principal Component Analysis; Rotation Method: Varimax with Kaiser Normalization; Rotation converged in six iterations.

4.2. Factor interpretation.

The resulting factors were evaluated individually. The first factor is characterised by the items 'green' (.893), 'sustainable' (.887), 'ecological worthwhile' (.879), 'environmentally responsible' (.849), 'environmentally sound' (.848), 'environmentally aware' (.828) and 'renewable' (.821). Each item showed factor loadings above the expected threshold of .7, and the explained total variance was 27.430 percent. Swan et al. (1988) stated that 'responsibility' is an element of trust that protects the interests of other people. In the context of green electricity, the interest of consumers purchasing green electricity is to obtain it from pure green energy sources. Therefore, this factor contains items referred to production types that are integrated into the factor 'responsibility'.

The items 'honest' (.826), 'sincere' (.795), 'trustworthy' (.793) and 'reliable' (.792) loaded on the second factor, which explained 19.392 percent of total variance. These items represent the degree to which consumers recognise that suppliers stand by their offers and statements and fulfil promises to consumers and can thus be summarised in a factor referred to as 'authenticity'. Authenticity can be defined as granting an accurate representation of facts or reliability (The Free Dictionary, 2014). Further, in modern consumer culture, authenticity is often characterised as trustworthiness (Gustafsson, 2006).

The third factor explained 15.651 percent of total variance and was indicated by the items 'approachable' (.868), 'accessible' (.855), 'customer oriented' (.766) and 'service oriented' (.753). This factor is referred to as 'openness'. The existing literature on trust does not include

this factor. A possible explanation for this exclusion may be that this aspect acquired only minor significance in research on business-to-business relationships. As the results of the exploratory factor analysis show, 'openness' is clearly a factor of trust. People or organisations that are inaccessible to others provide no chance to test them and thus cannot achieve trust (Luhmann, 1989). On this basis, the factor 'openness' can be used to conceptualise consumer trust in green electricity suppliers (as an organisation).

Analysis of the fourth factor showed that the item 'experienced' (.786) exceeded the threshold of .7 for factor loadings (Hair Jr. et al., 2006). According to Hair et al. (2006), the items 'well-known' (.677), 'expert' (.650) and 'knowledgeable' (.640) achieve factor loadings with practical significance at values above .5. This factor explains 12.845 percent of total variance, which is a sufficient result. All items refer to the expertise of the supplier and thus the factor is referred to as 'competence'. Results from exploratory factor analysis are also supported by the identification during the literature analysis of 'competence' as a factor of consumer trust (Swan et al., 1988).

In the study, all four factors had a coefficient alpha higher than .7 (table 3). Factors one to three show coefficients higher than .9 while factor four ('competence') showed a value of .753. Once analysed that factor, the item 'well-known' does not fit thematically with the other items of the factor. The items, except 'well-known', deal with the competence or ability of the supplier. It is possible that a supplier is well-known not based on competence but because of negative actions. This was confirmed by the corrected item to total analysis. Deleting this item results in an increase of the coefficient alpha to .858 (appendix D).

Comparing the number of items in each factor, the first factor is an outlier with seven items. Moreover, the items 'environmentally...' are semantically similar, 'renewable' is regarded as a synonym for 'green' as well as 'sustainable'. A reduction of items was used to address these aspects. As a guideline, a similar number of items for all factors was intended. Thus, only the four items with the highest loadings were selected for further analysis, namely 'green', 'sustainable', 'ecologically worthwhile' and 'environmentally responsible'.

After these adjustments, exploratory factor analysis was carried out for the newly revised list with 15 remaining items. This analysis resulted in a manageable measurement model for trust with four factors. The explained total variance was 82.278% (23.219% for factor 1; 21.688% for factor 2; 21.292% for factor 3; 16,080% for factor 4).

4.3. Overall model fit

To ensure convergent and discriminant validity, an exploratory factor analysis was conducted for each factor. The extracted factor should explain a minimum of 50 percent of the variance of the item, while singular factor loading should be higher than .4 (Homburg and Giering, 1996); as shown in table 4, explained variance of each factor is higher than the required minimum. Goodness of fit measures indicate a good model fit based on CMIN/df=1.635, CFI=.987 and RMSEA=.034. The values in Table 4 demonstrate appropriate indicator and factor loadings as well as factor reliabilities that exceed the threshold of .6. The AVE for the latent trust construct have values exceeding .5 in all cases; convergent validity can be assumed (Hair Jr. et al., 2006).

Table 4. Internal consistency of factors and convergent validity (Sample 1)

Factor	Item	Corrected item-total correlation	Factor loading (≥.4)	Coefficient alpha (≥.7)	Explained total variance (≥50%)
		Internal consistency			
Responsibility	Green	.834	.894	.935	83.717
	Sustainable	.847	.888		
	Ecologically Worthwhile	.826	.881		
	Environmentally Responsible	.879	.851		
Authenticity	Honest	.830	.827	.929	82.402
	Sincere	.916	.812		
	Reliable	.904	.807		
	Trustworthy	.900	.806		
Openness	Approachable	.842	.882	.922	81.096
	Accessible	.800	.872		
	Customer oriented	.832	.773		
	Service oriented	.805	.750		
Competence	Experienced	.686	.844	.858	77.956
	Expert	.784	.807		
	Knowledgeable	.726	.778		

Factor	Item	FL (≥ .4)	IR (≥ .4)	FR (≥ .6)	AVE (≥ .5)
		Convergent validity			
Responsibility	Environmentally Responsible	.861	.741	.935	.783
	Ecologically Worthwhile	.874	.764		
	Sustainable	.926	.858		
	Green	.878	.770		
Authenticity	Trustworthy	.912	.831	.928	.764
	Reliable	.895	.802		
	Sincere	.833	.694		
	Honest	.855	.732		
Openness	Service oriented	.876	.767	.921	.745
	Customer oriented	.897	.805		
	Accessible	.822	.675		
	Approachable	.857	.734		
Competence	Knowledgeable	.821	.802	.861	.688
	Expert	.895	.802		
	Experienced	.740	.548		

Discriminant validity was assessed by the Fornell-Larcker criterion (Fornell and Larcker, 1981; Ulaga and Eggert, 2005). Table 5 shows an adequate level of discriminant validity demonstrating the independence among the four constructs (Hair Jr. et al., 2010).

Table 5. Discriminant Validity (Sample 1)

	Openness	Responsibility	Authenticity	Competence
Openness	**.745**			
Responsibility	.467	**.783**		
Authenticity	.672	.537	**.764**	
Competence	.635	.307	.637	**.688**

Note: Bold numbers on the diagonal exhibit the AVE. The numbers below the diagonals reveal the squared correlation of the two constructs.

5.2 Assessment of the measurement model - Control sample

Once developed the model to measure consumer trust in (green) electricity suppliers, the next step is assessing the model to study its consistency in different time intervals. The data showed a good behaviour for KMO and Bartlett's test, as explained in the analysis of data set. The exploratory factor analysis deployed followed the same procedures than in the main sample. Based on eigenvalues higher than one, the analysis resulted in four factors with a total explained variance of 84.98 percent (table 6).

Table 6. Total Variance Explained (sample 2)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	Variance %	Cumulative	Total	Variance %	Cumulative	Total	Variance %	Cumulative
1	7.405	49.364	49.364	7.405	49.364	49.364	3.533	23.553	23.553
2	2.709	18.063	67.427	2.709	18.063	67.427	3.392	22.611	46.165
3	1.538	10.254	77.681	1.538	10.254	77.681	2.930	19.535	65.700
4	1.096	7.303	84.985	1.096	7.303	84.985	2.893	19.285	84.985

The factors and related items confirm the model of the first study. Although the percentage of explained variance of each factor differs and the items show different factor loadings, the overall structure of the model can be confirmed. The factor 'authenticity' consists of the items 'trustworthy', 'honest', 'reliable' and 'sincere'. The factor 'responsibility' consists of the items 'green', 'ecologically worthwhile', 'environmentally responsible' and 'sustainable'. The factor 'openness' consists of the items 'service oriented', 'approachable', 'accessible' and 'customer oriented'. The factor 'competence' consists of the items 'expert', 'experienced' and 'knowledgeable'. The analysis for internal consistency showed appropriate values, and also convergent and discriminant validity can be assumed. The evaluation of measurement quality also provided acceptable results. Goodness of fit measures of the confirmatory factor analysis (i.e., CMIN/df = 1.662, CFI = .958 as well as RMSEA= .089) indicated adequate model fit. Factor loadings and AVE exceed the minimum thresholds and validity can be verified (table 7).

Table 7. Internal consistency of factors and convergent validity (sample 2, n=85)

Internal Consistency					
Factor	**Item**	**Corrected item-total correlation**	**Factor loading (≥.4)**	**Coefficient alpha (≥.7)**	**Total Explained Variance (≥50%)**
Responsibility	Green Ecologically Worthwhile Environmentally Responsible Sustainable	.884 .861 .845 .683	.920 .911 .892 .748	.920	80.922
Authenticity	Trustworthy Honest Reliable Sincere	.915 .905 .906 .838	.904 .888 .854 .804	.955	88.185
Openness	Service oriented Approachable Accessible Customer oriented	.806 .780 .741 .749	.856 .837 .738 .667	.895	76.208
Competence	Expert Experienced Knowledgeable	.940 .885 .867	.925 .895 .846	.950	91.221
Convergent validity					
Factor	**Item**	**FL (≥ .4)**	**IR (≥ .4)**	**FR (≥ .6)**	**AVE (≥ .5)**
Responsibility	Green Ecologically Worthwhile Environmentally Responsible Sustainable	.887 .964 .900 .707	.787 .930 .810 .499	.925	.756
Authenticity	Trustworthy Honest Reliable Sincere	.972 .918 .929 .891	.946 .843 .863 .793	.961	.861
Openness	Service oriented Approachable Accessible Customer oriented	.849 .832 .797 .830	.721 .692 .635 .689	.897	.684
Competence	Expert Experienced Knowledgeable	.981 .925 .898	.963 .855 .806	.954	.875

Table 8 shows that the lowest AVE exceeds the highest squared correlation between a pair of constructs; the postulated coherences between the factors and the trust construct are supported.

Table 8. Discriminant Validity (Sample 2)

	Openness	**Responsibility**	**Authenticity**	**Competence**
Openness	**.684**			
Responsibility	.575	**.861**		
Authenticity	.329	.448	**.756**	
Competence	.632	.420	.213	**.875**

Note: Bold numbers on the diagonal exhibit the AVE. The numbers below the diagonals reveal the squared correlation of the two constructs.

5.3 Operationalization to measure trust: Final model explanation

Based on these results, the final measurement model consists of four factors: *competence*, *responsibility*, *openness*, and *authenticity* (figure 1). *Competence* describes the consumers' perception of a supplier ability to deliver the desired performance. The factor 'responsibility' indicate whether the supplier intends to deliver an environmentally-beneficial product of the declared quality and intends to keep its environmental promises. The third factor 'openness' describes consumers' evaluation of whether the electricity supplier provides an open information exchange. *Authenticity* reflects the way a supplier keeps its promises and delivers on its offers.

Figure 1. Factors and items of green trust.
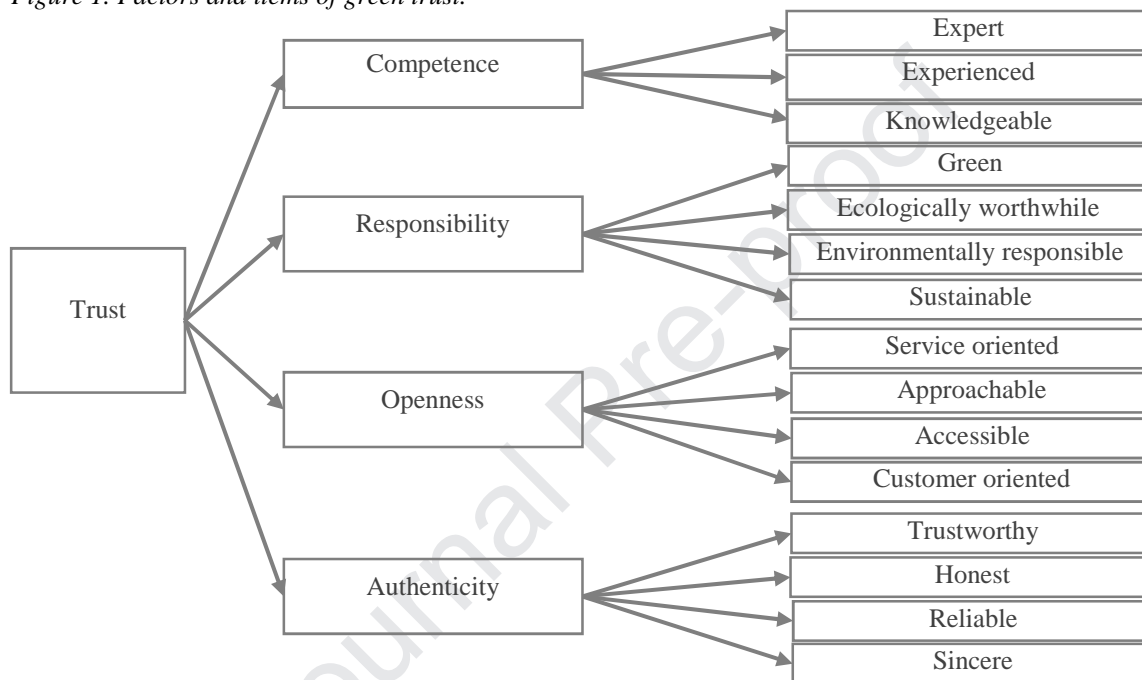
In summary, trust in green electricity providers represents the attitude of an electricity consumer towards its provider, considering that this provider acts in an environmentally responsible manner by competently and sustainably supplying electricity that (based on its origin) can be considered 'green' (i.e., ecologically worthwhile and responsible) while engaging with consumers openly and authentically through its marketing activities.

6. Conclusion.

The phenomenon of trust has received increased attention in literature, as it highly influence customer behaviour and long-term relationships. Indeed, previous literature has offered interesting insights and dimensions intending to measure it. However, it doesn't exist a comprehensive approach to capture the entire scope of trust and, specifically, no attempt to measure trust in green energy suppliers. The current research extends the understanding of 'green trust' providing a measurement model through a multi-dimensional approach that intends to capture its complexity. It let gain a higher precision of its understanding in a context of high credence quality and a continuous purchasing situation.

From a theoretical perspective, the paper contributes to prior research in two ways, in the multi-factorial approach to measure trust and in the conceptualization of green trust. First, the

current research is aligned with existing studies on the overall trust construct (Delgado-Ballester et al., 2003; Ganesan, 1994; Moorman et al., 1993). We agree on that the multiple-factor approach better covers the broad nature of the construct, integrating different realities. Indeed, in order to facilitate a wider understanding of trust, the factors denomination intended to interconnect previous theoretical contributions (Swan et al., 1988; Gustafsson, 2006). Furthermore, the measurement model suggested captures the specifics and essence of the green consumption, adapted to electricity markets, through the factor *responsibility*. The underlying indicators of *responsibility* contributes to the 'green' aspect of trust through the long-term orientation ('sustainable'), 'ecologically worthwhile' and 'environmentally responsible'; thus, it captures the environmental performance of green electricity providers. Second, this exercise helps to address shortcomings in prior academic discussions about the measurement of green trust in two directions. The first one is based on the measurement of green trust, because previous studies operationalised green trust as a single-factor and multi-item construct (Chen and Chang, 2010, 2012, 2013; Kikuchi-Uehara et al., 2016a, 2016b), and it is necessary to wider the scope to attend the complexity of trust. The second contribution is related to the wideness of green trust, while Chen and Chang (2013) operationalised their definition of green trust around the aspect of environmental performance, the present study enhances the ability to measure trust adding other factors. Consumers who do not perceive communication (e.g., production details, information environmental impacts such as CO_2 emissions) by electricity providers as competent, open and authentic may not regard the providers' environmental performance as relevant, sustainable and verifiable. Therefore, the green trust may not only consider the environmental performance of the product, but the whole performance and the perception of firm by customers. Other factors identified in literature (e.g. benevolence, dependability and integrity) were no considered as they do not provide an explanation for such a specific green product.

Among managerial implications, any study that can help better comprehend what influence consumers' trust is important; particularly, in a growing and complex market as green industries, where the influence of intangible factors is basic. Among the levers identified to build green consumer trust, *authenticity* implies the development of a clear and documented communication between company and consumer; it is important to fulfil promises. The sources used by the provider and the environmental impact are two main issues highly interesting for consumers, so, managers should offer fluent documentation justifying the supplier practices. The *responsibility* reflects the green features of trust in such a specific market as electricity markets; customers expect suppliers offer environmentally sustainable and ecologically sound products as well as developing actions to deliver positive environmental outcomes. It should be core in communication and marketing efforts to reinforce its impact on environment. The *openness* plays a major role in trust because it includes explaining the origin of electricity and the investment in facilities to foster this clean energy. It implies assuming service and customer orientation in the management of relationships through different channels, sales and after-sales staff, online media, customer events, and any type of communication selected. Finally, the *competence* is critical in order to customers rely on suppliers and their ability to perform their activity; the technical-based information, the technical knowledge of sales service and any dialogue sponsored by suppliers with experts in the field can help demonstrate this expertise. Besides these ideas, German managers in the electricity markets may consider, if they do not provide it, the offering of green based products due to their important acceptation by customers and the high implication by public authorities, which are trying to favour the energy transition towards a model based on renewable sources.

As recommendations to pubic authorities, we may mention that the policy should continue in this direction, as renewables energies are becoming more important in the energy supply in the whole country. Additionally, due to the complexity of the market and in order to facilitate consumers' recognition, the development of labels to signal good practice with environment can warrant the achievement of a minimum standard. It would facilitate the implementation and understanding of consumers without fraud or providing misleading customer information (Rohracher, 2009; Wüstenhagen and Bilharz, 2006).

As limitations of the study we may mention, first, it is necessary to mention that trust can be very specific for different market contexts. Despite some factors can be universal, this research is applied in the electricity market, so it is particularly applicable to similar markets. Second, the data collection is located in Germany, although it is a developed economy and has a strong presence of ecological behaviour, it should be taken under account those cultural norms, values and perceptions that influence customer behaviours (Solomon, 2011). Third, although the research includes two samples in different moments, the cross-sectional approach has some limitations that could be minimized through a longitudinal analysis to evaluate the evolution during time.

Further research can consider the validation of the measurement model in different countries and industries to assess its appropriateness in different contexts. Additionally, it would be worthy to apply the construct in a higher theoretical model that help study the influence of trust in relation to different antecedents, in their impact on loyalty or switching behaviour, important consequences associated in literature to trust. Maybe the comparison of the behaviour between green and regular consumers can stablish some basis that let differentiate the consumption patterns and decisions processes.

References:

Alam, S.S., Hashim, N.H.N., Rashid, M. Omar, N.A., Ahsan, N. Ismail, M.D., 2014. Smallscale households' renewable energy usage intention: theoretical development and empirical settings, Renew. Energy. 68, 255-263.

Albert, N., Merunka, D., 2013. The role of brand love in consumer brand relationships", J. Cons. Mark. 30 3: 258-266.

Anderson, J.C., Narus, J.A., 1990. A Model of Distributor Firm and Manufacturer Firm Working Partnerships. J. Mark., 541, 42-58.

Arkesteijn, K. Oerlemans, L., 2005. The early adoption of green power by Dutch households. An empirical exploration of factors influencing the early adoption of green electricity for domestic purposes. Energy Policy. 33, 183–196.

Arnott, D.C., Wilson, D., Arnott, D.C., 2007. Research on trust: a bibliography and brief bibliometric analysis of the special issue submissions. Eur. J. Market. 419/10, 1203-1240.

Arrow, K.J., 1973. Information and Economic Behavior. Svanbäck Nymans Boktryckeri AB, Stockholm.

Bang, H.-K., Ellinger, A.E., Hadjimarcou, J. Traichal, P.A., 2000 Consumer concern, knowledge, belief, and attitude toward renewable energy: an application of reasoned action theory. Psychol. Mark. 16, 449–468.

Bakay, Z., Schwaiger, M., 2006. Kundenbindung im liberalisierten Strommarkt. Die Betriebswirtschaft, 663, 326-344.

Berry, L.L., 1995. Relationship marketing of services—growing interest, emerging perspectives. J. Acad. Mark. Sci., 234, 236-245.

BDEW (2018a): Entwicklung der Bruttostromerzeugung in Deutschland, Stand 02/2018.

BDEW (2018b), Entwicklung der Stromerzeugung aus Erneuerbaren Energien in Deutschland, Stand 02/2018.

Bhattacherjee, A., 2002. Individual trust in online firms: Scale development and initial test. J. Manage. Inform. Syst. 191, 211-241.

BMU 2018 Renewable Energy Sources in Figures National and International Development, 2017 https://www.bmwi.de/Redaktion/EN/Publikationen/renewable-energy-sources-in-figures-2017.pdf?__blob=publicationFile&v=2

Brody, S., Grover, H., Vedlitz, A., 2012. Examining the willingness of Americans to alter behavior to mitigate climate change. Clim. Policy. 12, 1-22.

Casaló, L.V., Flavián, C., Guinalíu, M., 2010. Generating trust and satisfaction in e-services: The impact of usability on consumer behaviour. J. Relat. Market. 9, 247–263.

Chen, Y.-S., 2010. The Drivers of Green Brand Equity: Green Brand Image, Green Satisfaction, and Green Trust. J. Bus. Ethics. 93, 307–319.

Chen, Y.-S., Chang, C.-H., 2012. Enhance green purchase intentions: The roles of green perceived value, green perceived risk, and green trust. Manag. Decis. 50/3, 5502-5520.

Chen, Y.-S., & Chang, C.-H., 2013. Towards green trust: The influences of green perceived quality, green perceived risk, and green satisfaction. Manag. Decis, 51/1, 63-82.

Chen, M-F., Tung, P-J., 2014. Developing an extended Theory of Planned Behavior model to predictconsumers' intention to visit green hotels. Int. J. Hosp. Manag. 36, 221– 230

Chen, Y.-S., Lin, C.-Y., Weng, C.-S., 2015. The Influence of Environmental Friendliness on Green Trust: The Mediation Effects of Green Satisfaction and Green Perceived Quality. Sustainability, 78, 10135-10152.

Chen, M-F., 2016. Extending the theory of planned behavior model to explain people's energy savings and carbon reduction behavioral intentions to mitigate climate change in Taiwanemoral obligation matters. J. Clean Prod. 112, 1746-1753.

Churchill Jr., G.A., 1979. A Paradigm for Developing Better Measures of Marketing Constructs. J. Mark. Res. 16(1), 64-73.

Coleman, J. S., 1990. Foundations of Social Theory. Harvard University Press, Campridge, London.

Crosby, L.A., Evans, K.A., Cowles, D., 1990. Relationship quality in services selling: An interpersonal influence perspective. J. Mark., 543, 68-81.

Dahlstrom, R., Nygaard, A., 1995. An exploratory investigation of interpersonal trust in new and mature market economies. J. Retail. 714, 339-361.

David, R.J., Han, S.-K., 2004. A systematic assessment of the empirical support for transaction cost economics. Strateg. Manage. J. 251, 39-58.

Davies, M.A., Lassar, W., Manolis, C., Prince, M., Winsor, R.D., 2011. A model of trust and compliance in franchise relationships. J. Bus. Ventur. 263, 321-340.

Delgado-Ballester, E. Munuera-Alemán, J.L., Yagüe-Guillén, M.J., 2003. Development and validation of a brand trust scale. International J. Market Research, 451, 35-53.

Deutsch, M., 1960. The effect of motivational orientation upon trust and suspicion. Hum. Relat. 13, 123-140.

Doney, P.M., Cannon, J.P., 1997. An Examination of the Nature of Trust in Buyer-Seller Relationships. J. Mark. 61, 35-51.

Fornell, C., Larcker, D.F., 1981. Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. J. Mark. Res. 181, 39-50.

Galus, M.D., Schwabe, M., 2008. Wechselbarrieren bei Privatkunden. Energiewirtschaftliche Tagesfragen, 581/2, 28-31.

Gerbing, D.W., & Anderson, J.C., 1988. An Updated Paradigm for Scale Development Incorporating Unidimensionality and Its Assessment. J. Mark. Res., 25(2), 186-192.

Gustafsson, C., 2006. Brand Trust and Authenticity: The Link between Trust in Brands and the Consumer's Role on the Market. Assoc. for Consum. Res. 7, 522-527.

Gupta, S., Ogden, D.T., 2009. To buy or not to buy? A social dilemma perspective on green buying. J. Cons. Mark. 266, 376-391.

Hair Jr., J.F., Black, W.C., Babin, B.J., Anderson, R.E., Tatham, R.L., 2006. Multivariate Data Analysis. Pearson Education, NJ, Vol.6.

Hair Jr., J.F., Black, W.C., Babin, B.J., Anderson, R.E., 2010. Multivariate data analysis: A global perspective. Pearson Prentice Hall, Upper Saddle River, NJ.

Halder P., Pietarinen, J., Havu-Nuutinen, S, Pöllänen, S., Pelkonen, P., 2016, The Theory of Planned Behavior model and students' intentions to use bioenergy: A cross-cultural perspective. Renew. Energy. 89, 627-635.

Hall, S., Roelich, K., 2016. Business model innovation in electricity supply markets: the role of complex value in the United Kingdom. Energy Policy, 92, 286-298

Hansla, A., Gamble, A., Juliusson, A. & Gärling, T., 2008. Psychological determinants towards and willingness to pay for green electricity. Energy Policy. 36, 768–774.

Hartmann, P., Apaolaza Ibáñez, V., 2007. Managing customer loyalty in liberalized residential energy markets: The impact of energy branding. Energy Policy. 354, 2661-2672.

Hawes, J.M., Mast, K.E., Swan, J.E., 1989. Trust Earning Perceptions of Sellers and Buyers. J. Person. Sell. & Sales Manag. 91, 1-8.

Hentschel, M., Ketter, W. Collins, J. 2018. Renewable energy cooperatives: Facilitating the energy transition at the Port of Rotterdam. Energy Policy, 121, 61-69.

Homburg, C., Giering, A. 1996. Konzeptualisierung und Operationalisierung komplexer Konstrukte. Marketing ZFP, 11, 5-24.

Kahn, M.E., 2007. Do greens drive hummers or hybrids? Environmental ideology as a determinant of consumer choice. J. Environ. Econ. Manage. 54 2, 129–145.

Kenning, P., 2008. The influence of general trust and specific trust on buying behaviour. Int. J. Retail & Distrib. Manag. 366, 461-476.

Kenning, P., Blut, M., 2006. Vertrauen: Ein Objekt des Marketingmanagements?. In Bauer, H.H., Neumann, M., Schüle A. (Eds.), Konsumentenvertrauen: Konzepte und Anwendungen für ein nachhaltiges Kundenbindungsmanagement. Verlag Franz Vahlen, Munchen.

Kikuchi-Uehara, E. Nakatani, J., Hirao, M., 2016a. Analysis of factors influencing consumers' proe-nvironmental behavior based on life cycle thinking. Part I: effect of environmental awareness and trust in environmental information on product choice. J. Clean Prod. 117, 10-18.

Kikuchi-Uehara, E. Nakatani, J. Hirao, M. 2016b. Analysis of factors influencing consumers' proenvironmental behavior based on life cycle thinking. Part II: trust model of environmental information. J. Clean Prod. 125: 216-226,

Kotchen, M.J., Moore, M.R., 2007. Private provision of environmental public goods: Household participation in green-electricity programs. J. Environ. Econ. Manage. 53, 1-16.

Krollmann, T., Herr, C., 2005. Die Vertrauenswürdigkeit von jungen Unternehmen im elektronischen Handel. Die Betriebswirtschaft, 2, 119-136.

Langniß, O., Diekmann, J., Lehr, U., 2009. Advanced mechanisms for the promotion of renewable energy-Models for the future evolution of the German Renewable Energy Act. Energy Policy, 374, 1289-1297.

Laroche, M., Bergeron, J., Barbaro-Forleo, G., 2001. Targeting consumers who are willing to pay more for environmentally friendly products. J. Cons. Market. 18(6), 503–520.

Lee, M.K.O., Turban, E., 2001. A Trust Model for Consumer Internet Shopping. International J. Electron. Commer. 61, 75-91.

Luhmann, N., 1989. Vertrauen - ein Mechanismus der Reduktion sozialer Komplexität. Vol.3. Ferdinand Enke Verlag, Stuttgart.

Mcknight, D.H., Chervany, N.L., 2001. What Trust Means in E-Commerce Customer Relationships: An Interdisciplinary Conceptual Typology. Int. J. Electron. Commer. 6, 35-59.

Moorman, C., Deshpandé, R., Zaltman, G., 1993. Factors affecting trust in market research relationships. J. Mark., 571, 81-101.

Morgan, R.M., Hunt, S.D., 1994. The commitment-trust theory of relationship marketing. J. Mark., 58, 20-38.

Muraca, B., Neuber, F., 2018. Viable and convivial technologies: Considerations on Climate Engineering from a degrowth perspective. J. Clean. Prod. 197/2, 1810-1822

Neumann, M.M., 2006. Konsumentenvertrauen - Messung, Determinanten und Konsequenzen. Deutscher Universitäts-Verlag, GWV Fachverlage GmbH, Wiesbaden.

Okazaki, S., Li, H. Hirose, M., 2009. Consumer privacy concerns and preference for degree of regulatory control - A study of mobile advertising in Japan. J. Advert. 384, 63-77.

Paco, A., Rapose, M., 2009. Green. segmentation: an application to the Portuguese consumer market. Market. Intellig. Plann. 27, 3, 364–379.

Park, J. K., Gunn, F., Han, S.-L., 2012. Multidimensional trust building in e-retailing: Cross-cultural differences in trust formation and implications for perceived risk. J. Retail. Consum. Serv. 19, 304-312.

Rampl, L.V., Eberhardt, T., Schütte, R., Kenning, P., 2012. Consumer trust in food retailers: conceptual framework and empirical evidence. Int. J. Retail & Distrib. Manag. 404, 254-272.

Ranaweera, C., Prabhu, J., 2003. On the relative importance of customer satisfaction and trust as determinants of customer retention and positive word of mouth. J. Target., Measur. & Anal. Market. 121, 82-90.

Rempel, J.K., Holmes, J.G., Zanna, M.P., 1985. Trust in close relationships. J. Pers. Soc. Psychol. 491, 95-112.

Rohracher, H., 2009. Intermediaries and the governance of choices: the case of green electricity labelling. Environ. Plan. A. 41, 2014-2028.

Rowlands, I.H., Parker, P., Scott, D., 2002. Consumer perception of. green power. J. Cons. Market. 192, 112-129.

Rotter, J.B., 1967. A new scale for the measurement of interpersonal trust. J. Pers. 35651-665.

Salmela, S., Varho, V., 2006. Consumers in the green electricity market in Finland. Energy Policy. 34, 3669-3683.

Selnes, F., 1998. Antecedents and consequences of trust and satisfaction in buyer-seller relationships. Eur. J. Market. 323/4, 305-322.

Sdrolia, E., Zarotiadis, G. 2019. A Comprehensive Review for Green Product Term: From Definition to Evaluation. Journal of Economic Surveys, 33/1, 150–178

Sirdeshmukh, D., Singh, J., Sabol, B., 2002. Consumer trust, value, and loyalty in relational exchanges. J. Mark. 661, 15-37.

Solomon, M.R.l 2011. Consumer behavior: buying, having and being. Pearson Education, Upper Saddle River, N.J.

Stewart, D.W., 1981. The Application and Misapplication of Factor Analysis in Marketing Research. J. Mark. Res., 18(1), 51-62.

Strupeit, L., Palm A. 2016. Overcoming barriers to renewable energy diffusion: business models for customer-sited solar photovoltaics in Japan, Germany and the United States, J. Clean. Prod., 123, 124-136.

Sun, P.-C., Lin, C.-M., 2010. Building customer trust and loyalty: an empirical study in a retailing context. Serv. Ind. J. 309, 1439-1455.

Swan, J.E., Trawick Jr, I.F., Rink, D.R., Roberts, J.J., 1988. Measuring Dimensions of Purchaser Trust of Industrial Salespeople. J. Pers. Sell. & Sales Manag. 81, 1-9.

Ulaga, W., Eggert, A., 2005. Value-Based Differentiation in Business Relationships: Gaining and Sustaining Key Supplier Status. J. Mark. 701, 119-136.

Vermeir, I., Verbeke, W., 2008. Sustainable food consumption among young adults in Belgium: Theory of planned behaviour and the role of confidence and values. Ecol. Econ. 643, 542-553

Walsh, G., Groth, M., Wiedmann, K.-P., 2005. An Examination of Consumers' Motives to Switch Energy Suppliers. J. Market. Manag. 21, 421-440.

Wüstenhagen, R., Bilharz, M., 2006. Green energy market development in Germany: effective public policy and emerging customer demand. Energy Policy, 3413, 1681-1696.

Zaheer, A., McEvily, B., Perrone, V., 1998. Does Trust Matter? Exploring the Effects of Interorganizational and Interpersonal Trust on Performance. Organ. Sci. 92, 141-159.