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Whatever the customer wants, the customer gets? Exploring the gap between consumer preferences and default electricity products in Germany[☆]

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HIGHLIGHTS

- ▶ Study is based on 4968 experimental choices made by 414 German retail consumers.
- ▶ Apart from price, the electricity mix is the most important product attribute.
- ▶ Majority of consumers prefer nuclear-free electricity.
- ▶ Respondents are willing to pay a premium for green electricity.
- ▶ German default electricity mix does not correspond to current customer preferences.

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ABSTRACT

In liberalized electricity markets, residential customers can choose their preferred provider and select among a variety of different electricity products, including green power options. Successful product design and marketing strategies for green electricity may provide electricity providers with a competitive advantage, while at the same time contributing to energy policy objectives. This requires, however, a thorough understanding of customer preferences. We investigate the relative importance of different product attributes in creating customer value, and find that price and electricity mix are the two most important attributes. The German electricity customers we surveyed in 2009 expressed an implicit willingness to pay a premium of about 16% for electricity from renewable sources. We conclude that consumers are willing to pay a significant price premium for an upgrade from the current default electricity mix in Germany to a more environmentally friendly default electricity mix, and discuss implications for marketing strategy and energy policy. Our findings are based on a dataset of 4968 experimental choices made by 414 German residential consumers, collected in a stated preference survey.

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1. Introduction

Prior to the opening of energy markets for competition, most consumers were served by a monopoly utility. Electricity market liberalization gives customers the possibility to choose products that best match their preferences. Many countries in Europe, North America and the Asia-Pacific region have liberalized their electricity markets in recent years. Customers now have a choice between competing suppliers offering a range of products, and it is becoming increasingly valuable for electric utilities and other power marketers to understand customer preferences, decision-

making processes, and barriers to switching behavior. However, many customers are still reluctant to actively choose a new power provider as well as to opt out of their default option.

As illustrated by the literature review in the following section, there are many studies showing that consumers have positive attitudes towards renewable energy and a majority of consumers report a willingness to buy electricity generated from renewable energy sources, even at a premium. Nevertheless, the high level of reported willingness to pay (WTP) is often poorly reflected in actual market shares of green electricity products. Although many consumers express environmental attitudes, there is still only a rather small segment of consumers who make the leap from interest to purchase.

Behavioral economics provides possible explanations on why consumers do not easily adopt environmental innovation, such as green electricity, despite their positive attitudes towards the environment. An important area of research in behavioral economics implies that consumers' behavior can be influenced by simply

[☆] Parts of the text in this article have initially been drawn from the PhD dissertation of one of the co-authors who reports on a similar study conducted in Switzerland (Kaenzig, 2010; Burkhalter et al., 2009). The present paper is based on an entirely new dataset of German consumers.

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changing the default option (Thaler and Sunstein, 2008). The default option is what consumers receive if they do not explicitly ask for another product (Brown and Krishna, 2004). Rational choice, contrary to behavioral economics, would imply that individual decision-making is not influenced by the default. However, the power of defaults has been demonstrated in different fields, ranging from organ donorship through retirement funds to car sales (Goldstein et al., 2008; Johnson and Goldstein, 2003; Polak et al., 2008). Anderson (2003) and Sunstein and Thaler (2003) have shown that consumers tend to be reluctant to selecting an alternative to the default option. Electricity consumers may be no exception, but apart from a few natural experiments¹ and two laboratory experiments (Pichert and Katsikopoulos, 2008), there is a scarcity of empirical evidence so far about the specific influence of defaults on the choice of electricity products.

This study addresses whether specific characteristics of electricity products offered as the default (i.e. the standard electricity option the consumers would receive from their electric utility if they do not actively select an alternative) in Germany match the preferences of private consumers. To determine customers' preferred electricity product, we conducted computer-assisted personal interviews with 414 German residential electricity consumers, leading to a dataset of 4968 choices. We determined customer preferences and the importance of individual product attributes in consumer choice. The goal of this study is to contribute to filling research gaps by (1) analyzing German private-household customers' preferences for a large number of specific attributes of electricity products, (2) comparing customer preferences for electricity products to the average default electricity mix, (3) determining the preferred energy sources for electricity production, and (4) discussing implications for policy-makers, power marketers, and utilities.

This article proceeds as follows: Section 2 reviews the existing literature. Section 3 presents our main hypothesis. Section 4 describes the methodological approach and the design of the survey based on choice experiments. Section 5 presents the empirical results, including the part-worth utility estimations based on a hierarchical Bayes model, and an analysis of the preferred energy sources. Section 6 presents concluding remarks and avenues for future research.

2. Customer choice and default electricity mix in liberalized electricity markets

Purchase decisions in competitive electricity markets can be disaggregated into several phases: problem recognition, information search on products and power providers, evaluation of alternatives, selection, and purchase. The search and the selection of a new power product or a new power provider can be initiated and motivated by various factors, which has been investigated in several stated preference surveys. Watson et al. (2002) determined price, environmentally sound electricity production, and incentives for new customers as the most important motives for switching power providers. Rowlands et al. (2004) identified price, reliability of power supply, and service quality as the most important factors when choosing an electricity company, followed by environmental aspects, reputation of the power provider, and the location of the electricity generation. A study by Goett et al. (2000) analyzed preferences from small and medium business customers for 40

attributes of electricity products. Roe et al. (2001) and Bird et al. (2002) analyzed preferences of private household customers and found that they are willing to pay a higher price for green power than for the standard electricity mix. Customers prefer renewable energy sources (Borchers et al., 2007; Farhar, 1999; Kaenzig and Wüstenhagen, 2008; Mozumder et al. 2011) and many studies show that a majority of consumers report a willingness to buy electricity generated from renewable energy sources, even at a premium (Gerpott and Mahmudova, 2009; Hansla, 2011; Litvine and Wüstenhagen, 2011; Menegaki, 2012; Menges et al., 2004; Menges et al., 2005; Mewton and Cacho, 2011; Nomura and Akai, 2004; Oliver et al., 2011; Susaeta et al., 2011). The relative price premium customers are willing to pay varies significantly between studies. Possible explanations are differences in framing of the offer, as well as differences in household income and culture between countries. But according to all studies, respondents are willing to pay a price premium for green power products.

It has also been found that time-consuming and complicated purchase processes, complex products, non-transparent price models, as well as long-term contracts inhibit switching behavior (OECD, 2008; Rommel and Meyerhoff, 2009). Customer loyalty is considered to be significantly affected by customer satisfaction and the perception of switching costs (García-Acebrón et al., 2010; Hartmann and Apaolaza-Ibáñez, 2007). In many European countries with liberalized electricity markets and also in countries where green electricity products are widely available for private household customers, only a small share of consumers actively switched to green power products (Energie and Management, 2010; Wüstenhagen et al., 2003). Most consumers stay with their power provider and the product they are used to, and hereby avoid transaction costs.

The power of defaults provides an explanation as to why individuals stay with products they are used to, even though there may be alternatives on the market which would meet their preferences better. As default products are often used as reference products, consumers may see opting-out of the default as risky compared to the perceived safety of the default mix. Remaining with the default alternative avoids risk. Status quo biases (Kahneman et al., 1991; Samuelson and Zeckhauser, 1988) also heavily influence consumer behavior in the context of low involvement products such as electricity. Johnson and Goldstein (2003) have explained the effect of how defaults influence individuals' decision-making processes in different ways. On the one hand, defaults chosen by electricity providers can be perceived as implicit government recommendations. On the other hand, making an active decision requires physical effort and involves transaction cost (Samuelson and Zeckhauser, 1988). In connection to this, one explanation is the existence of human inertia. Especially when people have to deal with a complex decision-making process, they tend not to make any decision at all or delay it to a later point in time. This problem of inertia and procrastination is related to the concept of "bounded self-control" (Mullainathan and Thaler, 2000). Bounded self-control describes individuals who have the right intentions or beliefs but prove to be limited in their capacity or lack the willpower to execute their intentions to change behavior. Thus, the existence of inertia also explains the fact that default rules tend to be "sticky" (Thaler and Sunstein, 2003).

Pichert and Katsikopoulos (2008) present first empirical evidence showing that these cognitive biases and mechanisms also hold for default electricity mixes. With two laboratory experiments among 65 students and persons younger than 35, they showed that participants are more likely to choose a green power option when it is presented as the default product than when it is presented as an alternative. Most of the respondents would stay with the default electricity mix even if it costs more

¹ For example, the municipal utility of the City of St. Gallen in Switzerland has recently changed to a green default and found that 72 % of its residential customers stayed with the new default, while 10 % decided to actively downgrade to a cheaper product, and 18 % actively upgraded to one of two pure green power options (Graf, 2012).

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