

**PREFERENCES FOR GREEN ELECTRICITY AND ECO-LABELS:  
EMPIRICAL RESULTS FROM A MARKET SEGMENTATION ANALYSIS IN GERMANY**

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### **(1) Overview**

With the liberalization of the electricity market in 1998, German residential customers have been given the choice of their preferred electricity provider and electricity product among several competitors. However, despite the fact that recent consumer surveys show that many German citizens have strong preferences towards renewable energy sources in Germany (e.g. Kaenzig et al, 2011; Gerpott and Mahmudova, 2010), the share of green electricity consumers still is in the “single-digit percentage range” (Litvine and Wüstenhagen, 2011). In other words, even when consumers have a positive attitude towards green electricity, they are passive in their purchase decisions to a large extent. Our study focuses on the investigation of consumer segments based on their preferences towards green electricity product along with demographical, psychographic and behavioral characteristics in order to get a better understanding of the determinants of green electricity purchase decisions.

### **(2) Methods**

For testing consumer preferences towards green electricity we used a stated preference survey of 4968 experimental choices made by 414 respondents in Germany in 2009. To determine relevant product characteristics 7 product attributes at different levels were applied in the survey based on findings by Burkhalter et al (2009); power provider, location of electricity generation, monthly electricity cost, certification, price guarantee, cancellation period and electricity mix. Every survey participant was given 12 choice tasks to complete and each choice task included 3 randomly-generated product alternatives.

The dataset also consists of questions about demographic, psychographic and behavioral characteristics. This paper aims to segment consumers with high preference for “green” attributes of electricity products, namely an electricity mix with a high share of renewable energy sources, and the certification with an eco-label. Whereas most studies have followed an “a priori” segmentation approach, this paper takes the approach of a post hoc segmentation where market heterogeneity in attribute preferences was captured by making use of part-worth utilities to cluster respondents’ preferences. Part-worth utilities are used as the base to divide the respondents into various clusters. We then cross-classified the resulting market segments with respondents’ background variables to see whether those segments of electricity consumers who have strong preferences for environmentally friendly attributes of electricity mixes can be described by distinct demographic, psychological and behavioral attitudes. A latent class analysis was applied on the rest of the sample using Sawtooth Software based on part-worth utilities. Furthermore, we conducted a series of Mann-Whitney U-tests and chi-square tests to test for significant differences between the found segments.

### **(3) Results**

Our cluster analysis reveals five different consumer segments, that can be grouped into actual green power customers (n=29), three clusters of potential adopters (n=303), and a segment of unlikely adopters (n=82). The latter group

includes the most price-sensitive group of respondents. 'Potential adopters' constitute 73% of the sample and the majority belongs to the cluster 'Truly greens' (n=117), who show very similar preferences as 'Actual adopters'; they prefer an electricity mix containing only renewable energy resources, middle-sized or municipal power providers with domestic or regional electricity generation, and they are less price sensitive than the other two clusters of potential adopters. 'Price sensitive greens' considered electricity mix and monthly electricity costs to be similarly important. The third group among potential adopters is called 'motive alliance seekers' because of the mixed nature of their preferences.

Demographic, psychographic and behavioral characteristics were also tested among clusters. Results show that 'actual adopters' tend to be higher educated (p=0.006), and are likely to have better knowledge of eco-labels (p=0.030) than 'potential adopters'. Furthermore, 'actual adopters' perceive green electricity rather the same price level or somewhat more expensive (up to 10%) against the traditional electricity price than 'potential adopters' who seem to attach green electricity with a much higher price level (more than 10%). 'Actual adopters' also believe that their individual actions have an actual influence on environmental protection through purchase behavior (p=0.008) and are more willing to pay a premium for green electricity (p=0.012) than 'potential adopters'. Potential non-adopters differ significantly in income level (p=0.001) and the knowledge of eco-labels (p=0.005) from potential adopters. The majority of potential non-adopters (43%) estimate the price of green electricity in the highest category (p=0.047) and their WTP for green electricity is also significantly lower than in other clusters (p=0.001).

#### **(4) Conclusions**

Based on 4968 experimental choices of a representative sample of German consumers, our cluster analysis provides important insights for green power marketers and energy policy makers. As for marketing, identifying three clusters of potential adopters helps to demonstrate the significant market potential for green electricity in Germany, and helps marketers to target their efforts to the most promising customer segments. We also show that there is an interesting potential for regionalized marketing strategies, as some of the early adopters show a strong preference for municipal utilities or regional providers. For policy makers, our analysis highlights that the potential for eco-labelling to guide consumer decision making has yet to reach its full potential in the German electricity retail market, and provides specific evidence as to which eco-labels are trusted by and relevant for which customer segments.

#### **References**

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