Identifying fuel and poverty characteristics through e.on consumer records and geo-demographic segmentation data

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Project Background

Fuel poverty is known to be a distinct social problem, which can occur across a wide array of household demographics. The labelling of households through the associated definition has been under recent review and now encompasses two main elements of fuel poverty: energy cost and stability of household income. The Hills review definition (2012) provided a much-needed update, to more accurately identify the fuel poor in the UK. E.ON wanted to utilise this review in effort to align their obligations set by the government to provide support to disadvantaged customers. As a distinct social problem the occurrence of fuel poverty and its consequential impacts has been identified by many different studies, using a range of data sets. This dissertation presents a unique identification process, combining household resolution data with commercial grade geo-demographic customer segmentation classifications (CAMEO), not previously used in the identification of fuel poverty.

Data Methods

3.9 million E.ON customer data records were received with CAMEO classifications attached. Constraints associated with selecting a usable customer samples reduced the data set to 2.1 million records. Record eligibility was selected by the following criteria; reasonable consumption values and being a dual fuel customer reduced the data set significantly. Carrying out the filtering by use of the IBM software: SPSS, enabled the justified selection to be made, allowing for subsequent fuel poverty analysis.

Key Findings

From the 2.1 million dual fuel customers, the fuel poor were identified using the Hills definition (2012). This presented 211,441 households who were regarded as being below the fuel poverty threshold; a population representing 9.73% of the E.ON customer sample. This record has provided the high-resolution data sample displaying the characteristics of the fuel poor population as a whole. Figure 1 shows the distribution of the fuel poor population across England and Wales, using density mapping, areas representing high levels of fuel poverty prevalence include Liverpool, Manchester and the West Midlands.

Proportionally the fuel poor record possesses larger quantities of old terraced housing, whilst more recently built residences, particularly detached and semi-detached are less likely to house the fuel poor.

The associated depth of fuel poverty has been examined, presenting evidence that the composition of the fuel poor population is diverse within itself. Most notably the increase in the proportion of council tax-band A households, the highest disparity being over 8,000 households.

To validate the selection of fuel poor made statistical comparison to a previous study was made. A Pearson's correlation co-efficient of 0.584 ($p<0.05$) with an independent study by the Centre for Sustainable Energy, on the same geographic resolution was found. Predictive modelling presented no statistically significant correlations between variables in predicting fuel poverty, reasserting the complexity of the social issue whereby variables can negate one another.

Attempts to generate a predictive model from the most influential characteristics in determining fuel poverty were conducted.

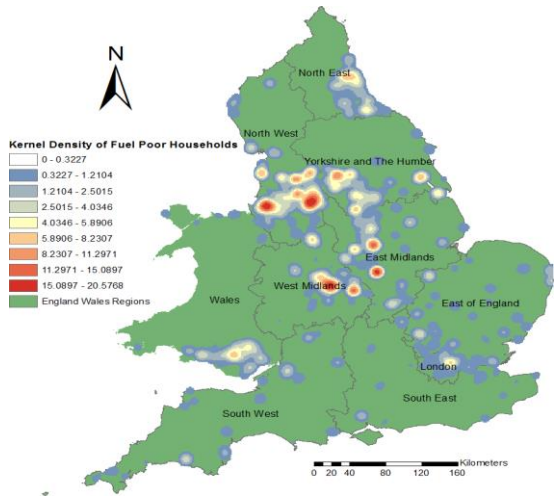

Figure 1 : Kernel density map of fuel poor customers across England and Wales

Value of the Research

Results presented in this study can be utilised by E.ON through production of customer specific marketing strategies aiming to alleviate fuel poverty amongst its customer base. Information produced will also enhance the understanding of the complexities of fuel poverty by displaying the distribution of the fuel poor and highlighting the most prevalent characteristics, supporting previously published literature.