

Which smart electricity service contracts will consumers accept? The demand for compensation in a platform market

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The value of the domestic consumer as grid resource for the provision of demand management services is at the heart of the transition to a two-sided platform market in domestic electricity services. This paper illustrates how this value can be exploited via contract design that takes consumer heterogeneity flexibly into account. We analyse how consumers value smart electricity services and which electricity service contract terms they would accept. We start with the prior that most households want compensation to accept smart electricity services contracts that involve remote monitoring and control by an electricity service provider. The demand analysis is based on a stated choice experiment conducted with 1,892 electricity consumers in the UK in 2015, shedding light on the key attributes that drive demand for smart electricity services. The statistical modelling takes different types of heterogeneity into account: a flexible mixed logit model is combined with posterior analysis to elicit consumer preferences and heterogeneity in valuations for smart electricity services. We suggest possible pricing strategies that could incentivise contract adoption by the number of customers required to provide the optimal level of demand response.

We find significant heterogeneity in valuations for most of the considered contract attributes, suggesting that customer profiling based on posterior analysis could inform contract design. The results suggest that a mixture of fixed and transaction based payment to the consumers could promote the acceptance of smart electricity services contracts. A fixed monthly compensation for remote monitoring and control by the service provider could be supplemented

by charges for technical support and data privacy services, depending on the consumer's preferences. The transaction based payment could be based on the expected electricity bill savings.

We find that consumers demand statistically significant compensation to accept remote monitoring and control by a service provider. And the most remarkable contract differentiation potential has been revealed to lie in the data services: the compensation needed to accept the sharing of usage and personal data is significant, but varies substantially across the identified customer clusters. The smart electricity platform service provider should hence consider carefully which customer segments to address regarding data sharing. By contrast, we find that consumers value technical support relatively homogeneously and would be willing to pay for it.

We also illustrate that while customer group profiles can inform the design of contract menus, individual profiles can inform customer specific contracts. Small niche service providers for example might want to attract customers whose preferences for electricity contracts are quite different from those of the other customer clusters. Under these circumstances, customer specific contract design might be viable and valuable.

In combination with more information on local balancing cost and required customer acceptance rates, our results suggest efficient pricing strategies for platform service providers and suppliers that carefully take consumer preferences and engagement into account. The findings of this paper could inform competition authorities, regulators and smart service providers and feed into future research in a smart grid context in which customer heterogeneity can be exploited for effective demand side management.

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