

CURTAILING USE OF LARGE DOMESTIC APPLIANCES DURING THE PEAK ELECTRICITY LOAD PERIODS

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Curtailing use of large domestic appliances during the peak electricity load periods ¹

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OVERVIEW

The time of peak electricity use ('load') on the Irish electricity network is during the early evening when people finish work. This period of peak electricity load is also the time when the cost of producing electricity is generally highest so reducing the peak load or shifting some of the demand to other times of the day can reduce overall electricity production costs, which ultimately impacts on prices customers face.

The advent of smart electricity meters, where electricity use can be monitored in real time, combined with "smart" appliances, creates an opportunity to defer the use of large domestic appliances (e.g. ovens, dishwashers) to other times of the day. A benefit for the electricity sector is that with a lower peak load, the level of investment required to satisfy demand during peak periods is less than would occur otherwise. A benefit to customers is lower electricity prices overall and for customers that agree not to use specific appliances (e.g. dishwasher) during the peak period, an added benefit is that they receive financial compensation, e.g. a discount on their electricity bill.

This research examines electricity customers' attitudes towards future electricity supply contracts that may include appliance curtailment clauses. Results indicate that while there is a wide variance in customers' views, curtailment contracts related to dishwashers, washing machines, and tumble dryers are more likely to be acceptable to customers compared to electric ovens. For instance, to agree to a contract where use of their oven may be restricted on some occasions during the evening peak period (5-8pm), customers wanted compensation in excess of €20 per bimonthly bill, on average. The mean bimonthly electricity bill is approximately €145. For every appliance curtailment (up to 9 per month), customers would like an additional €1 of compensation, on average. For greater control over when

¹ This Bulletin summarizes the findings from: Curtis, J., Grilli, G., Brazil, W., Harold, J. (2020) "Why do preferences for electricity services differ? Domestic appliance curtailment contracts in Ireland", *Energy Research & Social Science*, Available online: <https://doi.org/10.1016/j.erss.2020.101705>

curtailment events would happen, customers were willing to forego between €2-4 compensation per bimonthly bill if they had the option to either override a specific curtailment (i.e. still use the appliance) or if they were given 12 hours advance notice of curtailments.

METHODS

The data used in the research is from a survey undertaken in summer 2018 of the adult population stratified by region, gender, age and employment status to match the 2016 Irish Census of Population. Survey respondents watched a short, animated video explaining how curtailment contracts would work and then were asked to choose between several curtailment contract options, including their existing electricity contract that had no provision for appliance curtailments. Statistical techniques were used to investigate customers' preferences with respect to various elements of the curtailment contracts including compensation levels, frequency of curtailments, advance notice of curtailments, and the option to override a curtailment (i.e. still use the appliance).

POLICY IMPLICATIONS

Roughly 7 out of 8 people are potentially willing to contemplate appliance curtailment contracts, though in reality sign-up for such contracts is likely to be considerably less, as households exhibit considerable inertia with respect to switching utility providers for cheaper rates. Nonetheless, this means that curtailment contracts could be a viable policy option to manage peak electricity loads.

Customers are generally willing to accept curtailment contracts for dishwashers, washing machines and tumble dryers but much less so in the case of ovens. An important feature of acceptance of appliance curtailment contracts are features that give customers greater control over curtailment events. These include having advance notice of curtailments or having the option to override a curtailment (i.e. still use the appliance). Without these features it is likely that customers would be less likely to sign-up to curtailment contracts.

While several socio-economic variables are loosely associated with preferences over electricity curtailment contracts (e.g. age, family size, environmental attitudes) there is no clear-cut, well-defined profile of what type of households are most likely to sign-up to curtailment contracts. Future customers are likely to have more in common with each other in terms of their families' lifestyles, routines and work schedules rather than similarities in terms of the usual demographic variables used to profile households (e.g. age, education, etc.). An implication for electricity retailers is that to make supply contracts with appliance curtailment clauses appealing to customers, tailored contracts for specific customer cohorts rather than a one-size-fits-all contract may be necessary.

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