

Accepting remote control of household appliances, is more information less efficient?

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The increased production of green electricity leads to a greater volatility in supply. This increases the probability of mismatch between supply and demand, which can lead to either power shortage, or a need to shut down the production. This problem can be reduced by demand response. The response can be manual (e.g. reactions to text messages) or it can be automated, so that the power companies can control (part of) the private electricity consumption. In this paper we investigate the willingness of electricity consumers to accept automated response controlled by the electricity company.

In Denmark, refrigerators and freezers account for almost 10% of the electricity consumption, (4% during the evening peak hour), and when remote control of heat pumps and electric cars become possible in the future, automated demand response will be a significant factor in the green transition.

We invited 36.000 randomly selected households to join a field experiment on shifting the timing of electricity use. A third of the 2.700 who accepted to participate were offered a device, which could remote control their refrigerator, so that the power company could shift the timing of power consumption across the day. We use socio demographic information from Statistics Denmark to control for the self-selection, and the results therefore represent the behavior of a random customer at the power company.

Almost 900 households were offered a device. Half of the customers were given an option to switch off the automatic response for 24 hours when needed.

The results show, that if men were presented with the option to switch off, 58% accepted, if women were given this option, only 43% accepted. If no option to switch off were presented, 57% of the men and 56% of the women accepted. We expected a positive effect of allowing more control, but in this case, the general acceptance rate is significantly lower if the option is mentioned, i.e. more information is less effective.