

Peak Load Habits for Sale? Soft Load Control and Consumer Preferences on the Electricity Market

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In Sweden and elsewhere in Europe, electricity markets are changing and the transformation is characterized by three key factors: (i) deregulation of electricity markets, (ii) new technologies with respect to generation, distribution and use, and (iii) substantial changes in the production mix as a result of energy and climate policy as well as changes in relative production costs for different technologies. These factors in combination with a relative rigid demand side characterized by daily and seasonal use patterns, and consumers that are not exposed to the time of use marginal generation cost, have raised concerns about security of supply.

In line with these observations, attention has been brought towards demand flexibility and demand side management. So far, demand side management in Sweden has targeted large industrial electricity consumers at moments of imminent power shortages. The balancing of intermittent power production, however, requires more adaptable resources that can be activated at short notice during all times of the year, and the household sector in general, and detached and terrace houses in particular, may have a large potential in this context.

In this study we estimate Swedish household's willingness to accept load restrictions for electricity use during peak hours using a stated preference approach. Two types of load restrictions are considered: "soft control", which refers to a temporary restriction in the maximum possible load (in watt) for high-power appliances and installations; and "hard control", which refers to a complete loss of power for a 30-minute period during peak time. The resulting monetary compensation for the "soft" load control can be interpreted as the value of potential lost load (VoPLL), whereas the monetary compensation for complete loss of load corresponds to the value of lost load (VoLL).

The results reveal that demand response relying on behavioral change is costly in the sense that households require a high compensation for accepting restrictions. That is, the risk of not being able to, say, make dinner at the usual time may be very disruptive for the household, and this disruption is very costly, according to the results. One policy implication that follows immediately from the results is that specific policies aiming at stimulating behavioral changes probably will be very ineffective and/or costly. This implies that demand response through curtailment actions may be less cost-effective than supply response and/or automation and passive response.

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