# IEA, DSM REPORT EXECUTIVE SUMMARY

# Task XI Subtask 3

# Demand Side Bidding for Smaller Customers

Background

Demand side bidding (DSB) is a mechanism enabling the demand side of electricity markets to participate in energy trading. Many countries are concerned that liberalised markets may not deliver adequate generation and network capacity. Greater participation of the demand side is a very important mechanism for addressing these issues and improving overall balancing of markets.

The domestic sector consumes between 20% and 40% of electricity in developed countries and is attractive for consideration of DSB. This report analyses and quantifies the potential and value of smaller customer DSB. Smaller customers willing to change demand can trade this activity with the help of demand Aggregators and be rewarded through reduced price for electricity or a direct payment. The process of DSB can provide benefits to System Operators, Suppliers and Customers. Changes in demand can result from customers actually reducing energy use, modifying times at which demand is taken or operating embedded generation. Verifying that individual customer demand has actually "turned down" in response to requests by System Operators or Suppliers uses time of use metering for larger customers. Smaller customers require other arrangements. Dynamic changes to smaller customer demand profiles impact "profile" settlement systems, and may require more complex arrangements.

Objectives

Demand Side Bidding is a process for formulating and delivering demand changes at customer premises in order to benefit System Operators, Suppliers and customers. It allows demand changes to be predicted, made to happen on a reliable basis and be built into schedules as alternatives to generation in meeting system demand. This study report addresses the feasibility and viability of DSB for smaller customers.

Approach

Mechanisms for enabling the demand side to participate in energy markets have been developed for larger customers in many countries. Customers participating in DSB are rewarded for making demand "available" and for implementing "turndown" when required. These actions require validation in order to be rewarded. The study has analysed requirements and mechanisms for validation of blocks of smaller customer demands and possible impacts of dynamic demand profiles on settlement systems. Analysis has been carried out into potential end use demands which could be aggregated and made available by customers. Consideration has also been given to payments made for demand "turndown" by smaller customers and possible costs of implementing automatic systems.

Results

In order to be effective, predictable and reliable, automatic demand changes are required by System Operators and Suppliers. The results of this study show that in principle, DSB for smaller customers could be implemented using available communication technology. However, more cost effective solutions are needed to enable bidding small demands to be viable in wide scale markets. Smaller customer demands between 0.5kW and 3kW per customer have been shown to be potentially "available" for aggregation. Targeting high demand, smaller customers using electric space heating and cooling, water heating and embedded generation is the most attractive starting point for DSB cost effectiveness. Refrigeration and lighting are also shown to be attractive targets for DSB implementation.

Implications

This study has shown that in principle, DSB for aggregated smaller customer demands is technically feasible and would contribute significantly to system management. However, a number of areas of further study have been identified. Progress in these areas will assist in moving DSB for smaller customers closer to reality. These areas are :-

- Quantify the extent to which smaller customers are prepared to bid specific end use demands and the motivators needed.
- Develop cost effective mechanisms and processes for aggregating smaller customer demand, validating demand "available" and validating demand "turn down".
- Quantify the impact of smaller customer, dynamic profiles on "profile" settlements systems.

International Energy Agency Demand-Side Management Programme
**Task XI: Time of Use Pricing and Energy Use for Demand Management Delivery**

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