

IEA DSM TASK XIX

Micro Demand Response and Energy Saving



Why Micro Demand Response?

Energy plays a central role in our everyday lives. We use electricity for lighting our homes and offices and for powering our refrigerators, televisions and computers. For most of the time, we don't even think about the energy we use; it's simply there and allows us to carry on with our everyday activities. However, our energy use has significant impacts on the environment and global warming.

The domestic and SME sectors alone consume up to 50% of the electricity generated in developed countries, and are good targets for energy saving measures. There are other reasons though to focus on these sectors.

The generation of and demand for electricity must be kept in balance at all times. Traditionally, this is achieved by managing the output of generators. However, increasingly the Demand Side is being actively managed as a way to achieve actual and financial system balance. The involvement of those demanding energy can help to improve overall system balance and thus reduce the peak generation capacity and spinning reserve.

For domestic and SME customers to achieve these benefits, it is necessary to influence millions of micro loads. IEA DSM Task XI, *Time of Use Pricing and Energy Use for Demand Management Delivery*, showed that small customers could provide useful Demand Side services through the combination of End Use Monitoring and Feedback (EUMF), Time of Use (TOU) pricing, and Demand Side Bidding (DSB). The work also demonstrated that relatively small amounts of demand flexibility can have large benefits in reducing peak capacity requirements.

Main Activities

The Task's main objective is to take the results of Task XI a stage further and quantify the costs, benefits, and business viability of

Demand Reduction (DR) through the use of EUMF, TOU and DSB with domestic and SME customers. It is envisioned that providing DR services to these markets will create new business opportunities for Energy Saving Service Providers and/or Demand Aggregators.

Subtasks

To conduct the work, Task XIX is divided into six Subtasks.

Subtask 1—DR & Energy Saving Products

- Define DR parameters required by System Operator, Energy Suppliers and Balance Responsible Parties.
- Determine Energy savings from DR and EUMF products.

Subtask 2—DR and Energy Saving Delivery Mechanisms

- Define mechanisms for motivating and delivering energy savings by residential and SME customers (disaggregated demand information, TOU pricing, remote switching, DSB and customer interviews).
- Define "smart" metering, disaggregated data and control mechanisms for motivating and delivering demand shifting by residential and SME customers (metering, switching, pricing, EUMF).

Subtask 3—End Use Demand Changes

- Identify specific demands which could be influenced by the demand change motivating mechanisms defined above.
- Identify what demand changes may be possible as a result of applying the motivators to SME end uses.
- Identify what demand changes may be possible as a result of applying the motivators to residential customer end uses.
- Outline technical architectures for collecting and estimating end use demand information and delivering control motivators to change demand.

Subtask 4—SME Customer Costs and Benefits

- Determine ESSP/DAG costs and benefits for delivering Energy Saving and Demand

- Shift services for SME customers using disaggregated demand information, metering and control.
- Determine ESSP/DAG implementation methodologies for delivering benefits and viable businesses.
- Estimate energy savings.

Subtask 5—Residential Customer Costs and Benefits

- Determine ESSP/DAG costs and benefits for delivering Energy Saving and Demand Shift services for residential customers using disaggregated demand information, metering and control.
- Determine ESSP/DAG implementation methodologies for delivering benefits and viable businesses.
- Estimate energy savings.

Subtask 6—Business Case Estimation

- Determine customer financial instruments and reward mechanisms to achieve commercially viable ESSP/DAG businesses delivering CO₂ savings and equivalent, network and generation capacity provision, by modifying demands of residential and SME customers.
- Quantify the potential for DR and energy saving measures to be accredited for meeting Government, Regulator and Supplier energy saving targets (White Certificates, CERT, etc.) and obtaining financial support.
- Compare overall costs and benefits.

Participation

This Task will begin the end of 2008 and countries and organizations are welcome to join. To discuss participation contact the Operating Agent.

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Task Web Site

<http://www.ieadsm.org/ViewTask.aspx?ID=16&Task=19&Sort=0#anc1181>

Reasons to Participate

- ◆ Understand the advantages and disadvantages of TOU pricing, Demand Response and demand disaggregation and feedback for residential and SME customers in competitive energy markets
- ◆ Gain an independent view of technology and benefits available for TOU pricing and demand disaggregation
- ◆ Quantify the value and technologies for end use monitoring and feedback, TOU Pricing and DR to customers and its potential for achieving DSM objectives
- ◆ Develop national policies to encourage time of use metering, pricing and demand disaggregation within competitive energy markets
- ◆ Understand the role of demand side participation in energy markets through the use of DSB/DR programmes and mechanisms
- ◆ Quantify the need for TOU metering or developed profile metering in order to validate DSB/DR implementation
- ◆ Quantify infrastructure needs for alternative load control options and savings calculations
- ◆ Understand the contribution that Dynamic DR can have on the improving the utilisation of wind generation capacity