



Development of Local Energy Model Using Virtual Aggregation

Overview

At present our domestic electricity use is sold on a flat tariff. You pay the same amount whenever you use it (with a few variations such as Economy 7 with 2 tariffs). The process whereby suppliers buy and sell power is called settlement. The system for domestic customers is called settlement on a profile. In contrast, large energy users pay different prices at different times of day; this is called half-hourly settlement.

The supplier who sells you your power has to pay generators different prices at different times of day. If you use power at a time when the power is cheap for the supplier to buy, this difference in price is not passed on to you.

When smartmeters are installed, it will record how much electricity is consumed each half-hour but the market is not set up to use this information for your benefit. We want to change this.

The idea

This innovative proposal is that a group of domestic customers come together under an entity called a Community Energy Services Company (CESCO). Their half-hourly smart meter readings are grouped together (referred to as 'virtually aggregated'). This forms one demand curve showing the energy used at different times of day.

The CESCO negotiates with a licensed supplier for time of use tariffs (that is, different prices for power at different times of day) for half-hourly settlement of this one demand curve. Customers are no longer settled on a profile but on half-hourly based on what they actually use and when. Whilst customers may sign up for a long term contract they are free to opt in or opt out of the CESCO and therefore the model does not affect competition

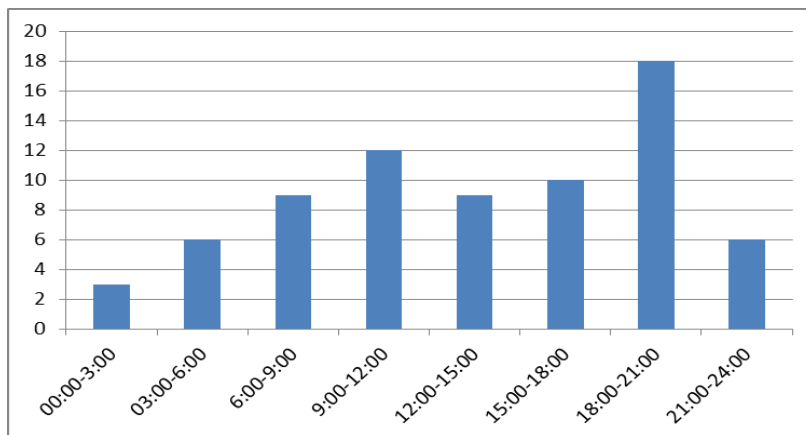
To increase the attractiveness to a supplier, a number of CESCOs may group together to negotiate with a supplier under a 'Community Services Enterprise' (CSE) who will also provide other support to CESCOs.

On-site Generation

Subject to Ofgem agreement, where there is on-site renewable energy this can be pooled within the CESCO. This means that the power can be used directly, reducing electricity bills.

Tariffs

Initially, the day may be spit up into 6-12 'chunks' with different prices for power for each chunk. The graph is just an example of how tariffs might vary.



Once we have shown the model works, we may wish to work with a supplier to try different pricing schemes. For example, with different prices in summer and winter or to encourage the use of power from wind farms or solar panels.

Changes in prices like this would be hard to take advantage of without automatic control.

Local control

To help members of a CESCO use local generation and take advantage the changes in prices, we are trialling technology to automatically control appliances such as water heaters, washing machines, dishwashers and possibly store some power.

This system operates on a community scale so everyone gets a benefit. The benefits may be grow as the controls are fully developed

The types of load to control are:

- Storage heaters
- Electric water heaters
- Washing machines and dishwashers
- Scheduling heat pumps with heat stores

Benefits

Energy Local has many benefits:

- Sharing the benefit of renewable energy (e.g. PV on roofs for social housing)
- Tackling fuel poverty
- Cost-effective time-of-Use -Tariffs for domestic customers.
- Rewards for Demand Side Management.
- Bulk purchase of power

- 'pooling' the use of generation within a CESCO to minimise export. This maximises the benefit of generation to a CESCO and increases its value. Effectively the generation is behind the 'virtually aggregated' meter and therefore can be used by anyone in the CESCO before being regarded as export.
- Increases the benefits of generation and storage to customers. Customers who don't have the capital to buy small scale generation can benefit from local generation via a CESCO.
- The existing settlement is used but domestic customers can access half-hourly settlement.