

In the heat of the moment

Sian Crampsie finds that demand response offers new support for CHP

Combined heat and power (CHP) plants are playing an increasing role in boosting the flexibility of the country's electricity system.

CHP capacity is often in the form of small or medium-sized on-site generation units, but it can vary enormously, depending on the customer for the heat. The variety of sizes and types of CHP is illustrated by the table on the following page, with data from the *New Power* database.

Some plants are run by large industrial producers and in many the requirement for heat is what drives operation. Electricity is a by-product. That has made it difficult to develop CHP, despite the fact that CHP can offer far higher overall efficiency than a thermal plant used only for electricity production. Rewarding that efficiency, and rewarding the ability to produce low-carbon heat and power if renewable fuels are used, has proved a difficult nut for policymakers to crack. Past policies were often of little benefit. The Renewables Obligation rewarded only the green electricity production – often a small proportion of the total energy produced and one that was unpredictable because power production was led by heat need. The Renewable Heat Incentive has been slightly more beneficial for plants fuelled by biomass, but the administration cost is high. Neither incentive supports gas-fuelled CHP, which remains attractive, although gas is a fossil fuel, because it is so efficient.

Now the growing interest in using the demand side to help balance the system offers a revenue stream for CHP owners. It represents a hidden resource that can be used to benefit not only consumers and asset owners, but also the electricity system itself. Organisations such as the Association for Decentralised Energy (ADE) say CHP units

can be quickly ramped up or down, making them an important element in the growing demand-side response (DSR) market. They are being tapped by third parties that can aggregate supplies from a number of plants to share the cost of participating and remove the risk that any one plant cannot react on cue. In a 2016 report, ADE noted that there is around 5.3GW of on-site CHP capacity installed on the distribution network in businesses across the UK. Based on current load factors, more than 48 per cent of the current business-led CHP capacity remains available for flexibility services – equivalent to 2.3GW of capacity.

Large industrial sites with CHP installed regularly operate below full load so can turn up production at short notice. CHP plants in the commercial sector, which often use reciprocating engines, can provide flexibility during the 6-9 am peak, says ADE.

Other good sources of flexibility are community energy schemes, says Dr Alastair Martin, founder of demand aggregator Flexitricity. Such schemes tend to evolve slowly, providing either downturn or upturn flexibility at different times in their development.

Flexitricity recently announced that the Gateshead District Energy project would become part of the firm's demand response network when it starts operating in mid-2017. Such flexible CHP schemes not only help balance the network, they also reduce the need for new investment in generating capacity and provide extra income for asset owners.

In the latest T-4 capacity market auction, around 1,400MW of DSR capacity won contracts, much of it tendered by Flexitricity. Auction results show that a total of 4,407MW of CHP and autogeneration plant won contracts to meet energy needs in 2020/21.

The potential of CHP in flexibility mechanisms is much greater, argues ADE, which believes that CHP operators have been put off by the complexity of the UK's capacity market. "It is a difficult market to participate in and many operators choose to focus on their 'day job'," says Martin. "Many don't realise how significant the capacity market could be for their business... they are missing out." 