

Zeroing in on waste

As the mountain of waste continues to grow (at over 3% per year) Woking wants to achieve an integrated holistic approach to waste management. It has developed a waste strategy which proposes waste prevention and reduction education programmes; material reclamation facilities (MRFs); anaerobic digestion; the thermal treatment of residual waste through gasification; and fuel cell CHP technology.



With this integrated approach, Woking hopes to achieve a state of Zero Waste. Its mix of education prevention messages and the use of technologies for the recycling of organics through anaerobic digestion and composting; the reduction of the residual through gasification and the reuse of the resultant material in construction; and the recovery of energy through fuel cell CHP technology, aims to bring about a major reduction in waste sent to landfill, without harmful emissions.

Woking's strategy incorporates the three Rs of the waste hierarchy - reduction, recycling and recovery. The strategy consists of six main components:

Two stream collection - a twin bin collection of waste from households which is then treated according to material type using the following technologies.

Materials Reclamation Facility (MRF) - the collected waste will be taken to an MRF where the recyclable materials will be separated. Waste will be put through a shredder to reduce its size and to remove the non-organic content. Organic waste will be put through a dewaterer to produce a sludge which will later be sent to an anaerobic digester. The residual from both streams will be used in energy recovery.

Composting - garden waste will be composted.

Anaerobic digestion - the sludge from the dewaterer will be processed in a type of giant compostor. The products of this process will be 75% water which can be cleaned and used for irrigation or to supplement the Basingstoke Canal and 25% will be a solid inert residue which will be mixed with compost and used as soil conditioner.

Thermal treatment centre - will gasify all residual waste. The definition of this process is 'the thermal breakdown of hydrocarbons into a gas via partial oxidation under the application of heat'. The products of this process are 25% ash and clinker for which there is a growing market in the construction industry. The gas produced will pass directly to the fuel cell.

Fuel cell - Gas is passed directly from the anaerobic digester and thermal treatment centre into the fuel cell. The fuel cell converts the gas into heat and electricity. No combustion is involved. This technology will eliminate the emissions associated with energy from waste. The products of the fuel cell are electrical energy and heat. The heat will first be used to drive turbines to produce more electricity and the residual heat will be used to support processes in the plant and to supply local residents. The only by-product is water.