

# Birmingham City Council Small scale Anaerobic Digestion

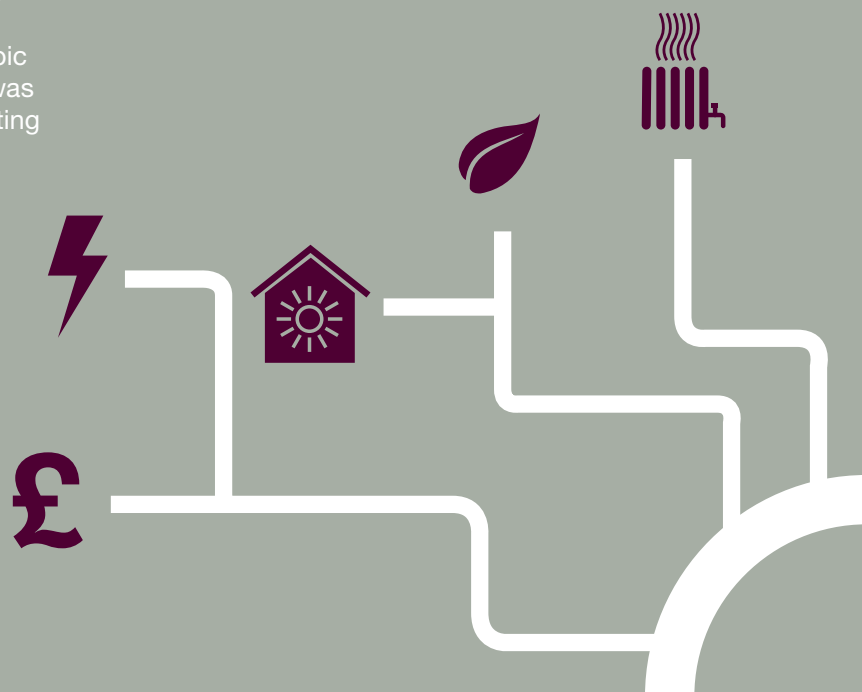
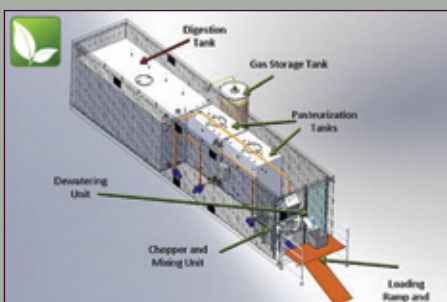
Development Plan (Kings Heath Nursery, Birmingham, UK)

**Overview: Birmingham City Council (BCC) received support from the BioenNW project to look at the potential deployment of a small scale bioenergy plant in Birmingham. It would be part of BCC's on-going efforts to transform the city into a sustainable energy user and improve organic waste management. Several sites were considered, with Kings Heath Nursery in Birmingham identified as having the most potential.**

Kings Heath Nursery is run by BCC's Parks and Nature Conservation Service as a nursery for growing bedding plants, which are used in displays. Also at the site is a horticultural facility which is used by BCC as a training centre to train parks staff and which also organises and hosts occasional events. A heated glasshouse occupies part of the site and houses a garden centre.

The development plan outlined an initiative to use green waste collected from the nursery and park activities as a feedstock for a small scale anaerobic digestion (AD) facility. A techno-economic case was supplied to BCC. This took into account two existing oil boilers and kerosene air heaters which are

used during spells of heavy frost to protect the plant stock. The small scale AD plant would provide heat and power to the horticultural training centre and glasshouses, supplementing heat currently provided by the two ageing oil boilers. Additional green waste material generated in the city (currently composted in wind rows outside) would also be available if necessary.



Small scale AD is a challenging technology with few market ready solutions available. The Kings Heath site currently uses around £30,000 in oil for heating and produces around 175 m<sup>3</sup> of green waste per year, which is removed in a segregated RORO skip at a cost to the site. The most commercially available technology for this site was identified to be a small scale AD unit housed entirely within a shipping container. The container would be located in the yard and plumbed into the horticultural centre's heating system. The electrical output of the engine would not be wired into the main distribution board at the centre and it was calculated that excess electricity would be generated above that required by the building. The container would also contain a pasteurisation unit for the AD digestate which could be used as a soil conditioner by the Parks and Nature Conservation Service activities.

The development plan identified that the future of the horticultural training centre was uncertain at the time of compilation due to budget cuts at BCC. As this is the anchor heat and power customer for this AD scheme it made the initiative a risky investment at this stage. However the mobility of the containerised system may allow for a lease arrangement that could be investigated with the equipment supplier.

## Outputs

The development plan identified the main costs and benefits associated with the project. The estimated payback period on an investment of approximately £180,000 would be within 10 years. The scheme would be able to benefit from the UK Feed in Tariff scheme and the Renewable Heat Incentive for biogas. The scheme electrical output would be 3.5 kW and would result in a CO<sub>2</sub> emissions saving of 40 tonnes per year. The main benefits to BCC would be savings made via the reduction in waste removal costs and CO<sub>2</sub> emissions, contributing to BCC's pledge to reduce its CO<sub>2</sub> emissions by 60% (from 1990) by 2027.

This development plan has been produced through BioenNW – a €7.9m strategic initiative of the European Union INTERREG IVB North West Europe Programme (2011-2015). BioenNW is led by the European Bioenergy Research Institute at Aston University, UK and sees 11 partners working together to deliver small-scale bioenergy schemes throughout North West Europe.



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