EXECUTIVE SUMMARY

This report investigates the feasibility of utilising small scale anaerobic digesters (AD) in mixed use developments. A model was developed that is capable of analysing the cost and emissions benefits of the system and as well as evaluating the biogas production from waste collected from a mix of building types within any development.

The model reflects a variety of scenarios of biogas utilisation, either directly by a retrofitted existing CHP engine, by a single, new biogas CHP, or by a new biogas CHP set to run alongside any existing CHP system.

The site evaluated within this report was Ethelred estate, a Southwark Council residential development in London that has recently been refurbished to improve the building's energy efficiency with the installation of a gas-fired CHP system and enhanced fabric insulation. The council requested a study into the feasibility of the use of AD on the site. This report was produced to evaluate the financial and carbon emission impacts on the Ethelred site.

The analysis found that relying on the waste available from the site alone did not allow a feasible option for operating a biogas CHP system. Further investigation found that, installing a new biogas-fired CHP engine of 220kWe as the heating lead to the existing systems under the assumption that waste can be brought onsite for digestion from the local area would result in significant cost savings and carbon emission reductions. An internal rate of return (IRR) on the original investment of nearly 20%, a net present value (NPV) of over £1.7 million at a 3.5% discount rate and an emission reduction of nearly 60% were predicted.

The physical restraints and other practical elements of installing AD plant on a site such as the Ethelred estate were not assessed within this report however it was found that if the site had restricted free area for the installation of a digester, a digester suitable for operating a 50kWe biogas CHP could be installed within an area of only 200m^2 (approximately 16 car parking spaces) and still achieve significant savings.

This engine would be capable of achieving an IRR of 8.6%, an NPV of over £160,000 and a carbon saving of over 20%.