Greengas Research Outlook Sweden, Ornskoldsvik, Sweden 23-25th March 2015

Food waste digestion in UK, experiences and ongoing development

Charles Banks University of Southampton, UK

The paper looks at the commercial development of anaerobic digestion of source segregated domestic food waste and catering waste in the UK. The development followed initial pilot scale trails at both mesophilic and thermophilic temperatures carried out in 2003 which and these led to the installation of the first full scale demonstration plant in 2006. The research and monitoring results that accompanied this development are presented and show that high ammonia concentrations led to process instability and potential failure. This was characterised by the long term accumulation of propionic acid which eventually overcame the buffering capacity of the digester causing the pH to fall to critical levels. The problem of volatile fatty acid accumulation was overcome by understanding the metabolic route that lead to methane formation at high ammonia concentrations and then controlling the digester to allow hydrogenotrophic methanogenesis to become the dominant pathway. The use of trace element supplements allowed the process to operate stably and also allowed the process organic loading rates to be increased significantly. There is now a well-developed biogas industry in the UK using food waste as main substrate with plants being installed with 100K tonnes per year capacity. A quality protocol has been adopted to allow safe use of the digestate from these digesters as a fertilizer in agricultural production