

EfW Optimisation and Control Needs Portable or Fixed Systems in Landfill, and Waste Food AD and Sludge AD as EfW Grows in Importance

Mounting energy costs will drive development of fossil-fuels alternatives, and mounting taxes on landfill, its avoidance. New products will be needed. Geotech's new product team is already busy.

For anaerobic digester (AD) operators, gas/CHP engine protection and control of expensive plant with continuous gas analysis it is essential. That is only part of the story; one person's waste can be another person's fuel and thus a resource with economic value driven up by oil prices. Ensuring maximum output of energy from waste (EfW) and maximum return on investment (ROI) are in objectives cited in anaerobic digestion (AD) planning. For water treatment of sewerage sludge, operators want AD processes which never fail, meet compliance demands and have a zero or negative carbon footprint and deliver EfW.

We see from four case studies where energy from waste with AD makes excellent use of today's modern technology from Geotech for optimisation and protection. They herald the future of control and optimisation across farm and food waste, food processing waste and water treatment sludge where AD takes full advantage of today's available technology and next, tomorrow's – from Geotech.

Case Study 1

Biogas analysis data feedback informs AD management and control and protects CHPs

For BiogenGreenfinch the key to successful AD operations includes managing feed mix and its loading while closely monitoring output biogas concentrations. At Twinwoods, a Geotech AEMS static continuous gas analyser, measures methane (CH₄) percentage and provides a 'switch on' signal for combined heat and power (CHP) engines. It also monitors carbon dioxide (CO₂), oxygen (O₂) and hydrogen sulphide (H₂S) with an H₂S engine cut-off point to protect CHP engines. The gas analyser data log confirms this for BiogenGreenfinch. Gas engine manufacturers can see warranty and service contract conditions un-breached.



Anaerobic digesters at BiogenGreenfinch

With the Geotech AEMS static gas analyser on constant watch and checking gas content, Phil Moffat, BiogenGreenfinch operations manager, says they look for changes and trends in the biogas content. "It is quick and easy because it is done automatically every fifteen minutes," Phil said. "It is the first thing we see. It helps us spot any change in digester health. This makes it possible for us, along with our expertise, to manage the feeding process accordingly."

Case Study 2

Keeping Sludge AD Working

Southern Water has an important routine; every day it checks the health of its sewage sludge anaerobic digesters on eighteen sites. This water utility ensures the security of its sewage sludge digesters working at their optimum and ensures industry best practice operating routines everywhere. They include analysis of pH/alkalinity, volatile fatty acids and biogas composition.



Picture, courtesy of Southern Water.

For biogas analysis Southern Water uses fourteen Geotech Biogas Check portable biogas analysers. They measure CH₄, H₂S, O₂ and CO₂ as the balance gas. Southern Water checks each digester is healthy, producing over sixty percent methane, the minimum for its CHP engines to generate electricity. The CHPs have a 1000ppm maximum for hydrogen sulphide. Above that, it may damage CHP engines.

Case Study 3

CHP Protection: Biogas from Potato Processing Waste Water

The static gas analyser at the UK's largest chip factory, McCain, Whittlesey protects its CHP engine as renewable energy provides about ten percent of annual electricity.



McCain Foods anaerobic lagoon in construction

McCain's covered anaerobic treatment lagoon produces CH₄ for burning or flaring from 77,000 cubic metres of wastewater rich in potato starch. McCain is burning its own biogas to reduce natural gas use. The static gas analyser is set to produce five readings. It automatically measures four extracted gases: methane, carbon dioxide, low-level oxygen and highly corrosive hydrogen sulphide before they enter a scrubber. It then measures H₂S after scrubbing. McCain's systems receive the reading signals, measured at 10-minute intervals, enabling the

company to achieve on-line, real-time, continuous monitoring of methane content and CHP engine protection from corrosive H₂S and explosive O₂ with the Geotech static gas analyser on guard as McCain's 'watchdog.'

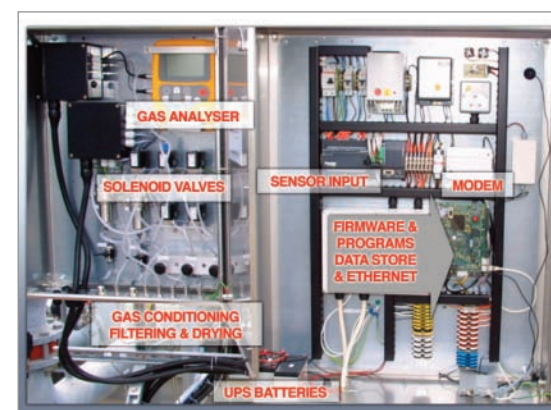
Case Study 4

Sludge Digestion Data – via Internet

United Utilities's Geotech AEMS static gas analyser has had positive response from everyone who has used it with the benefit of continuous analysis, measurement and data logging to help with 'tuning and tweaking' production to optimise sludge treatment and methane output. Now they can check it on Internet screen, from anywhere. Colin Greenhalgh, UU's wastewater treatment specialist, said, "The equipment will be absorbed into UU's Integrated Performance Management (IPM) system and is consistent with the IPM approach of making key operational data available anytime anywhere to help us ensure consistent effective and efficient operation of our assets."



Continuous data helps increase productivity



The 'brains' of Geotech's static gas Automated Extraction Monitoring System (AEMS)

United Utilities' methane comes from AD digesters. It feeds a CHP engine, so protecting it and optimising methane production is one driver. Another imperative is Environment Agency legislation compliance. Sludge is transported and as UU is processing waste it has to comply with Integrated Pollution Prevention and Control (PPC).

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