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Fresh thinking on sludge

A new conference was launched this year to bridge the gap between academic research and industry looking into the potential for sewage sludge as a valuable resource - SludgeTech. Held at the University of Surrey over two days 29-30 June 2015, the conference brought together academics from around the world to share their important research.

The instigator of the event was Nick Mills, Wastewater Innovation Manager at Thames Water. Nick said: "One of the drivers for setting up this new event was my frustration with 'sales pitch'-style papers. I wanted to have an event where quality science came first and researchers were encouraged to showcase their work in front of industry. So with help from the steering committee, seed funding from the Royal Commission of the Exhibition of 1851 and support from CIWEM for a technical publication post-conference, SludgeTech became a reality."

The event included a wide range of challenging presentations in a warm and collaborative atmosphere.

Maximising AD efficiency

Anaerobic digestion (AD) is the main process adopted by the water industry internationally for treatment to satisfy stability, microbiological and energy efficiency criteria. Maximising biomethane recovery and the AD contribution towards renewable energy targets is now a major priority. The conference opened with an investigation into how AD management techniques can improve efficiency. Research presented by Cranfield University showed increased methane production with exogenous CO₂ enrichment. Edmond Ndam of Newcastle University and Northumbrian Water had investigated the relationship between struvite and AD efficiency, and further papers looked at the effects of different dewatering techniques on process efficiency.

Resource recovery

There is also considerable potential for recovery of other biorenewable materials and industrial chemicals from



The University of Surrey

sludge. Research presented by Hazel Prichard of the University of Cardiff created a stir when she revealed the quantities of gold found in incinerator ash as well as gold, palladium and platinum (from catalytic converters) found in urban road drains. Dutch water company De Dommel showed how they were recovering both energy and phosphates at their centralised sludge processing plant, WWTP Tilburg. In the future, the WWTP envisages becoming a logistical centre for the treatment of sewage, sludge, manure and other biomass streams such as organic waste.

Thermal hydrolysis

A series of presentations from engineering, academic and utility company viewpoints explored the merits of thermal hydrolysis plants (THPs). One presentation, from Dutch water company Vechtstromen, explained how they have centralised their sludge treatment to maximise THP energy recovery.

Effects on pathogens

Microbiologists also presented the latest research on the efficacy of different technologies in destroying pathogens: Stefano Giacalone related a study of E.coli inactivation across all Thames Water's conventional sewage sludge treatment sites and Sarah Fane came away with a best presentation

prize for her explanation of a study into novel biosolids storage solutions to suppress E. coli.

End uses

Giuseppe Mininni from the Italian National Research Council's Water Research Institute presented the findings of the three-year EU-funded ROUTES project which compared outcomes from a number of sludge treatment technologies for agricultural end-products.

Environmental consultant Tim Evans presented the findings of an interesting market research project with United Utilities to find out how much farmers were prepared to pay for biosolids, which they currently receive free of charge.

Alternatives

Though agricultural recycling is currently considered the best practicable environmental option for sludge utilisation, acceptability of the practice varies widely between different European countries. Opportunities for post-AD energy recovery options involving pyrolysis or gasification that displace the land recycling operation are therefore of great interest to the industry and academic communities. One of the exciting developments in this area is a new process developed in Germany that creates biocoal for domestic heating from sewage sludge, explained by Dr Dominik Peus from Antaco.

Delegates came away from SludgeTech brimming with new ideas to put into practice and inform their decisions for the future. As Nick Mills says: "Exploiting our abundant resources is now becoming technically and economically feasible."