

Breakout session 2

Sludge

Summary

Aims of the session

- Identify technology solutions already available
- Identify possible technology development areas
- Identify opportunities for collaborative R&D

Needs and Issues

- No established community
- We need broad experience across biochemistry, accelerator science and end-users
- Industry steer is heavily focused on maximising energy recovery
- Very high volume industrial processing (5M litres per day at a single plant)
- Little measurement on the input side (oxygen demand and ammonia content). Problem therefore not well defined
- E-beam will only ever be one step in a more complex process
- Needs to be robust in a dirty environment (8000+ hrs per year)
- 2 areas where accelerators may be relevant:
 - Pre-digester, to improve efficiency in the digesting process
 - Post-digester, to clean up output gases

Other observations

- A few pilot plants have demonstrated some aspects, no widespread take-up. Why?
- What's required: High volume, low cost, ultra-reliable system.
- No-one is in disagreement that there may be something to offer in this area – it's worth investigating.

Next steps...

- **Mini project to confirm what e-beam has to offer**
 - Define exactly what the physical layout and biochemical requirements are
 - Confirm e-beam can meet these requirement at a small scale
 - Define radiation requirements
 - Leading to accelerator design
 - Optimise for reliability, cost effectiveness etc.
- Make an **outline proposal** for an industrial scale facility with estimates for capital and operating expenditure
- *This challenge is multi-disciplinary. STFC needs advice from industry, chemists, biologists, accelerator physicists...and to find the most appropriate funding route.*