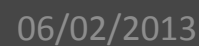
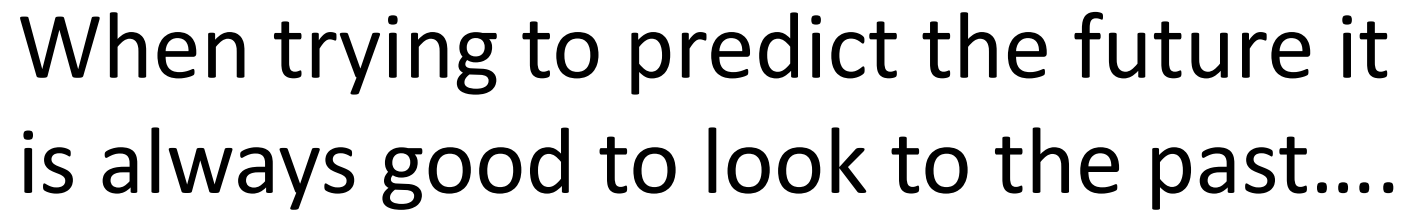




NACWA 2013 WINTER CONFERENCE

*Making Sense Out of the Emerging
Technology Market*







Hygiene Edict, 1539

- Francois, King of France, makes known his displeasure at the considerable deterioration visited upon the good city of Paris. One cannot journey through it without meeting with great perils and inconvenience.....





3 rules of edict

- Forbid the tossing into the streets of refuse, offals or putrefactions of any kind
- Command to retain any and all stagnant and sullied waters in the confines of your home
- Enjoin you to carry these and promptly empty into the stream and give chase with a bucket of clean water to hasten their course



It was a start....

Prior to 1500

- American Indians: offended by sanitary practices of settlers
- Romans: septage catapults
- Vikings: defecating in Anglo Saxon wells

Post 1500

- Incidents of major public health
- Regulatory control measures
- Major Projects and associated finance challenges
- Technology innovation (cess pits to toilets)
- Customer Service



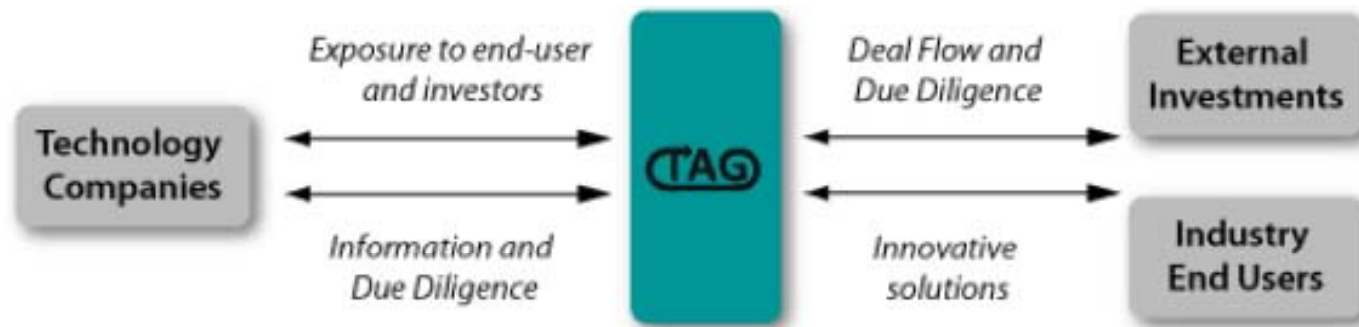
Introduction to Isle

- Boutique technology & innovation consultancy
- Water, waste, energy and low carbon
- Offices in UK, Australia and US
- ca 25 staff (plus ca 25 Associates)
- \$2.5m turnover
- **Technology Approval Group**
 - 100 utilities from around the world
 - Water TAG groups in N Europe, S Europe, Singapore (Asia), Australia, and California
- Company ethos: 'Give more than we take'
 - 50% of profits donated to water/sanitation start-ups (REEF)

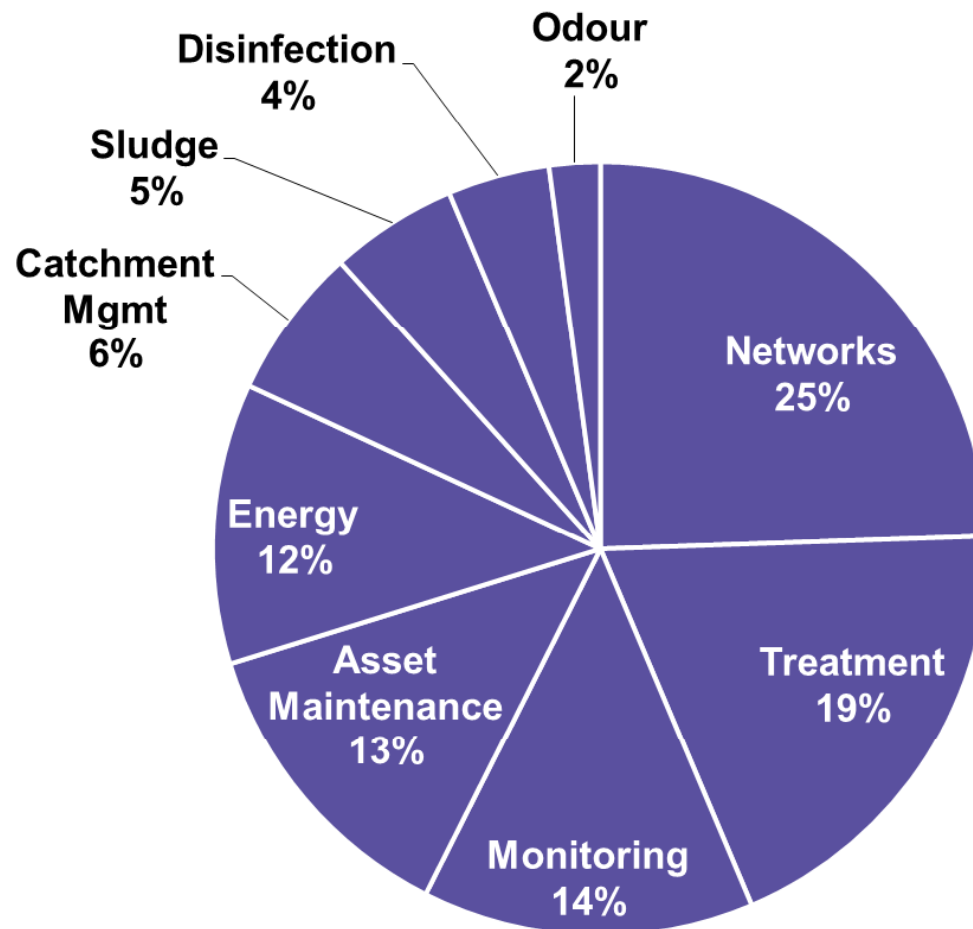


What is TAG?

- Innovation forum of the world's leading water utilities
- Unparalleled track record in bringing new technologies to market
- Industry collaboration
- Strong links to VC investors



Track Record



- **2,500** technologies since 2005
- **35** TAG meetings to date globally
- **150** presented at TAG
- **75%** have been taken forward by TAG members
- **~\$300m** of VC investment secured

European TAG Members



Our Australasia members



Micromidas – Sludge to Plastic

- Process converts wastewater solids into a bio-polyester plastic called PHA (polyhydroxylalkanoate)
- The process consists of modified digestion and aerobic fermentation
- The microbial population converts fatty acids into intracellular polymer
- The plastic is then extracted, polished, and sold as a plastic resin for use in multiple applications
- Plastic could be worth 5-10 times the value of biogas



Ostara – Nutrient recovery

- Nutrient removal from centrates following dewatering of sludge
- Recovery and recycling into a high value commercial fertiliser (Crystal Green™)
- Good uptake in North America
- Commercial roll-out in UK following demonstrations with Thames Water and Severn Trent Water
- Now looking at other markets
- Recent round of investment to support the commercial exploitation



SCFI- AquaCritox Supercritical Water Oxidation



- Complete destruction of digested sludge
- Trials in the pipeline with YW and STW, who will be sending sludge samples to their demonstration plant at Cork
- SCFI have secured a partnership with Parsons (for Engineering) and Rockwell (for instrumentation)
- Seeking €9m of investment
- Future plans include a €3m full-scale plant for an industrial client in Cork and also to develop a mobile unit



Xogen - Electrolytic process to destroy pathogens in minutes



- Xogen Technologies Inc. of Orangeville Ontario Canada has developed an electrolytic process to treat wastewater.
- Raw wastewater is passed between a series of metal plates that are subjected to an electrical current; hydrogen, oxygen, nitrogen and other gases are generated and degrade the organic material and pathogens in minutes.
- Removal of pharmaceuticals and PCPs.
- Full scale commercial plant is underway at Orangeville's Wastewater Treatment Plant, treating 30m³/d



Therm-Liner – Energy recovery from the sewer network



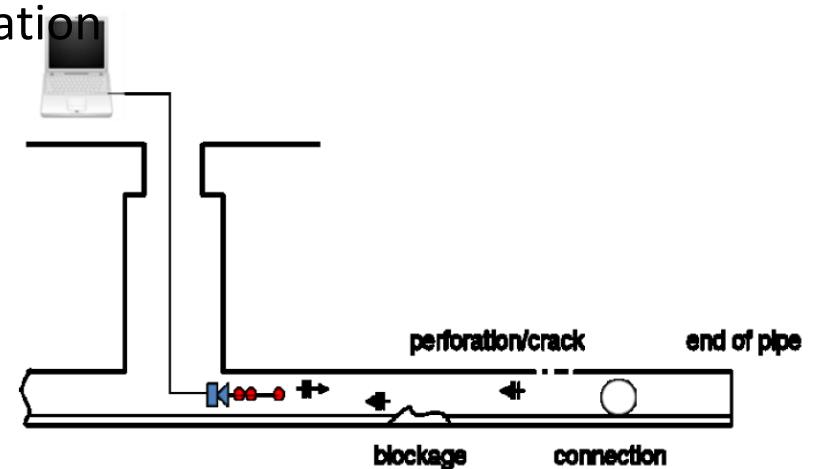
- Tapping into a source of unused raw energy
- Therm Liner is a method to harness and recycle this energy!
- To heat or to cool & acclimatise buildings.
- Retrofitted into new or existing sewer pipe systems
- Installed through normal manholes and interconnected in the pipe
- Uhrig have a number of commercial installations running in Germany, wider Europe & UAE
- Uhrig is developing a business model to suit other territories



SewerBatt – acoustic detection of sewer defects



- Rapid, acoustic detection of sewer defects and blockages
- Acoustic sensor which consists of an array of microphones and a speaker
- Electric block serves as an interface to exchange data between the acoustic sensor and the PC
- Used as a 'pre-survey' for CCTV prioritisation
- Measures effectiveness of cleaning
- Detects; laterals, blockages & cracks
- 150m in clay or concrete pipes
- 1 mile in plastic or concrete pipes with smooth joints



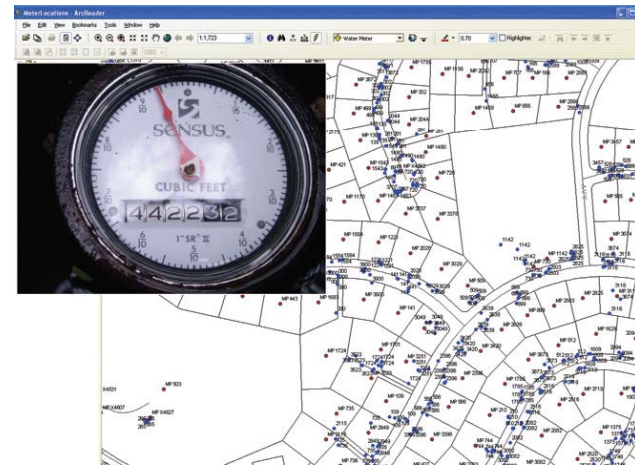
And finally, Customer Service...

- ‘The supply of water is absurdly inefficient. I am usually left on a Monday morning as dry as if there was no New River Company [Thames Water] – which I sometimes devoutly wish was the case!’
- Charles Dickens, Tavistock Square, London. 1853



Fathom - Utility optimisation services

- A cloud based suite of utility optimisation services that drive utility efficiency
- Utilises geo-spatial data from automated meter reading, billing and asset management
- Proven to increase revenue, decrease costs and improve customer service amongst existing customers
- The system can provide customers real-time consumption data, encouraging conservation and identifying leakage
- Improves life cycle of assets by allowing the real time tracking of their condition and maintenance



US TAG Members



- Next Drinking Water and Clean/Waste Water TAG groups in April 2013
- Open invite to come and try...

Thank you

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