

ADNET RESEARCH COLLOQUIUM

11TH SEPTEMBER 2017

~~REAL WORLD CHALLENGES IN MONITORING A FOOD WASTE DIGESTER~~

.....
R&D, SKILLS, EXPERTISE & TRAINING
IN A COMMERCIAL CONTEXT

BORE HILL FARM BIODIGESTER



www.malabybiogas.com



BORE HILL FARM BIODIGESTER

- 28,000 tpa food waste
- Excellent road connections
- Operational June 2012
- High Profile: Visitor Centre, Flexible Design, WRAP support, Centre of Excellence
- PAS110 June 2016



Innovation: Operational R&D, In House Odour Control System, Modular Decontamination System, Biochemical Enhancement, Gas Mixing, Integrated Development

LOCATION

Food Waste

26,000 tpa

98,000 ttd

Biofertiliser

25,000 tpa

92,000 ttd

Power

5m kWpa

45m kWtd

2,300 homes



IMPROVEMENTS & OPPORTUNITIES

Increased Inputs

- 18,000 - 26,000 tpa
- Liquids, Depack. & higher N

Increased Power

- 500 – 1,030 kW_e

Added Heat

- 600kW_{th} RHI

Flex the Process

- TEs: Cobalt & Selenium
- Condensate & mixers
- Digestate separation & PASI 10

Integrated Development

- R&D & Training Centre, Commercial, Residential & Community Uses**



CHANGE: CONCEPTUAL & INCREMENTAL

■ Cultural Change

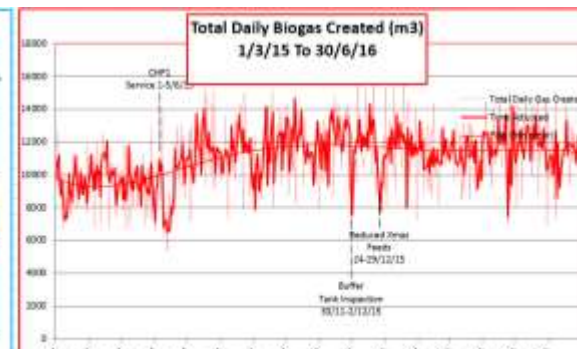
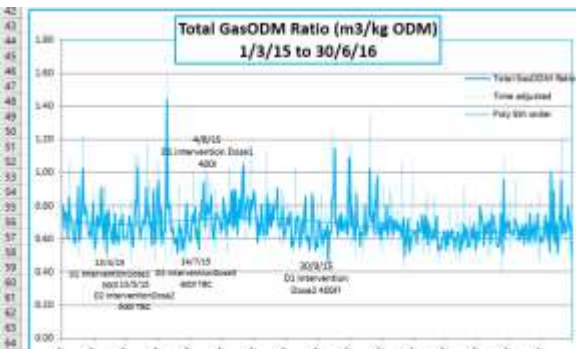
- Training for Change:
prepare & empower staff
- Educating for Change:
big picture – open the doors

■ Incremental Change

- Marginal Gain on Revenue:
gas quality, yield & consistency
- Marginal Gain on Cost:
digestate volume, opex & Wear 'n' Tear

■ Optimisation

- Trace Element, enzymes, potions, snake oil & tweaking



BIOFERTILISER NOT DIGESTATE

■ PASI 10: A Quality Product

■ Cost not Income –YET!

■ Physical Contaminants

■ Maceration & separation. 2mm Screen

■ Fibre recirculation

■ Nutrient Density/Volume

■ Storage, Haulage & Spreading costs

■ H2O removal: evaporation/freezing/filtering

■ Engage Decision Makers

■ Agronomist or farmer

■ New Opportunities



Digester 2 (D2)												Digestage Storage Tank (DS)																	
Volatile Fatty Acids												Volatile Fatty Acids																	
Sample Date	Total VFAs	Acetic Acid	Propionic Acid	iso Butyric	n-Butyric Acid	iso Valeric Acid	n-Valeric Acid	iso Caproic Acid	n-Caproic Acid	Acetic Acid Equiv.	P/A Ratio	DM	DOM	pH	FOS	TAC	Ratio	Total VFAs	Acetic Acid	Propionic Acid	iso Butyric	n-Butyric Acid	iso Valeric Acid	n-Valeric Acid	iso Caproic Acid	n-Caproic Acid	Acetic Acid Equiv.	P/A Ratio	Tot N.
	mg/l	mg/l	mg/l		mg/l	mg/l	mg/l	mg/l	mg/l	mg/l		%	%		mg/l	mg/l		mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l		mg/l
13/01/2017																													
06/03/2017	892	643	49.00	<12.5	<12.5	<25	<25	<20	<20	662	0.08	4.27	3.05	8.76	1644	34043		3434	1984	675	281	60	414	<25	<20	<20	<20	3019	0.34
10/04/2017	208	159	49.00	<12.5	<12.5	<25	<25	<20	<20	159	0.33			4.84	8.66			4433	3108	849	104	334	<25	<20	<20	<20	4091	0.27	
03/05/2017		93	49.00	<12.5	<12.5	<25	<25	<20	<20		0.33							2248	1338	813	32	<12.5		25	<25	<20	<20	2072	0.64
06/05/2017	300	451	49.00	<12.2	<12.5	<25	<25	<20	<20	482	0.31	4.36	2.91	8.67	6562	18460	0.36	3909	2569	816	140	29	303	30	<20	<20	3590	0.32	
06/08/2017	3615	2845	648.00	122	<12.5	<25	<25	<20	<20	3454	0.23			8.77	6653	22556	0.30	5245	3281	1832	76	20	36	<25	<20	<20	4853	0.58	

HEAT – UNDER UTILISED PART OF CHP

- **Pasteurisation**
- **Waste drying**
- **Process Water Heating**
- **Biofertiliser Concentration**
- **Space Heating**
- **District Heating**
- **R&D**



INTEGRATED SITE DEVELOPMENT

- Mixed Use Development
- R&D & Training Facility
- Community Facilities



CONCLUSION



- 5 ½ year operational record
- High standards
- Continual Improvement
- Flexibility
- Design for change
- Training & R&D - optimisation
- Aim to be Best in Class
- Collaboration
- Linking academia & commercial ops.
- Exemplar Model for global growth



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THANK YOU

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