Bio-Resources – Current Treatment & Performance

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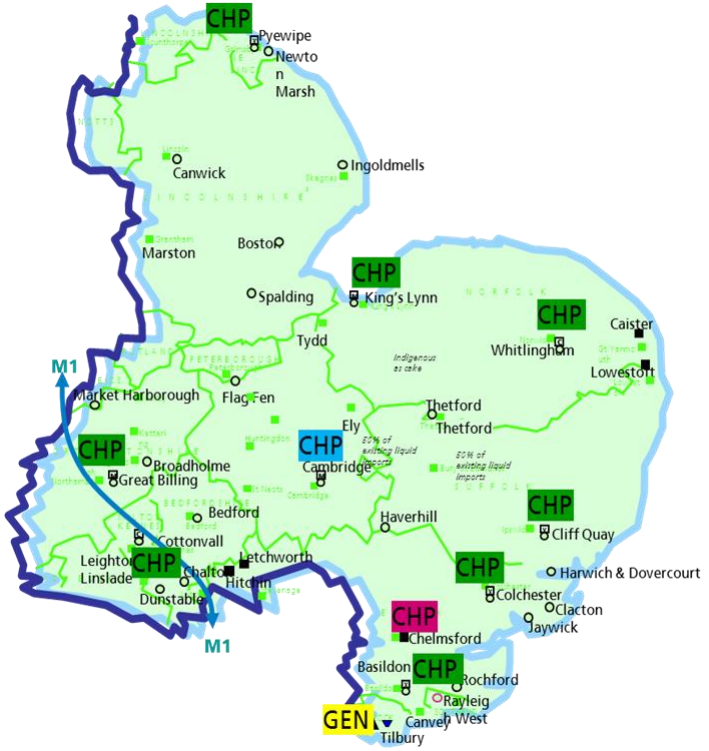
Our Sites


Great Billing Combined Heat and Power Plant, Northampton


CHP
Pyewipe
Newton Marsh
Canwick
Ingoldmells
Marston
Boston
Spalding
King's Lynn
Tydd
Caister
Whitlingham
Lowestoft
M1
Market Harborough
Flag Fen
Thetford
Ely
Broadholme
Great Billing
Cambridge
Bedford
Haverhill
Cliff Quay
Cottonvall
Leighton Linslade
Chalton
Hitchin
Letchworth
Dunstable
Harwich & Dovercourt
Colchester
Clacton
Jaywick
Chelmsford
Basildon
Rochford
Rayleigh
Canvey
West Tilbury
GEN

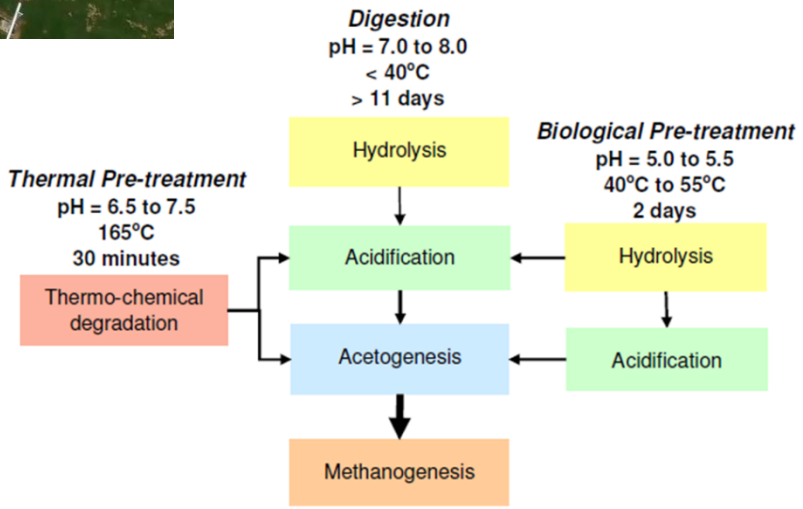
Our Feedstock

- Annual raw sludge production circa 150,000 tds per annum
- Produced at over 1100 WRC's
- Approx. 70% of sludge moved by truck as either liquid or raw dewatered cake into our STC's
- Growth and new quality drivers will result in increase in sludge production to approx. 161,000 tds by 2025

- further information available on our website

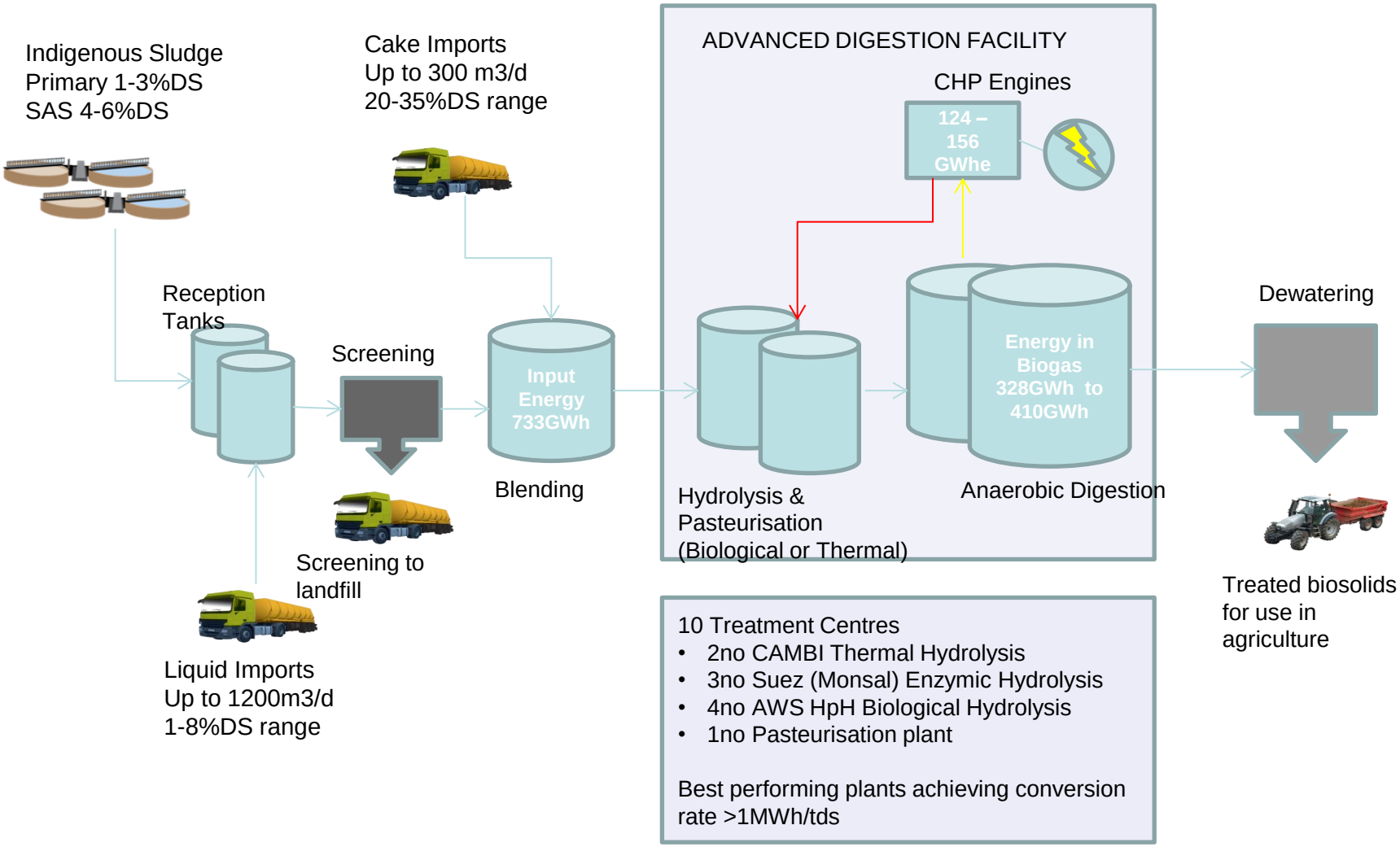
- http://www.anglianwater.co.uk/about-us/what-we-do/doing-business-with-others.aspx

Our Technology



Bio-Resources Treatment

Typical Flow sheet



Advanced Digestion Technologies used in Anglian Water

Cambi Thermal Hydrolysis

Cottonvalley STC

Cottonvalley (Milton Keynes)

- Commissioned 2008
- 20,600 tonnes dry solids per annum capacity
- 1.75MWe + 0.65KWe CHP engines

Whitlingham (Norwich)

- Commissioned 2010
- 20,800 tonnes dry solids per annum capacity
- 1.75MWe + 1.2MWe CHP engines
- Sharon Liquor treatment plant

Advanced Digestion Technologies used in Anglian Water

Suez Monsal Enhanced Enzymic Hydrolysis

Cambridge

- Commissioned in 2007
- 0.6MWe + 0.34MWe CHP engines
- 10,200 tonnes dry solids per annum capacity

Kings Lynn

- Commissioned in 2008
- First EEH plant to use steam heating
- 19,000 tonnes dry solids per annum capacity
- 2no. 1MWe CHP engines

Gt Billing (Northampton)

- Commissioned in 2010
- Largest STC operated by Anglian Water
- 36,500 tonnes dry solid per annum capacity
- 3no. 1.4MWe + 1.5MWe CHP engines

Kings Lynn STC

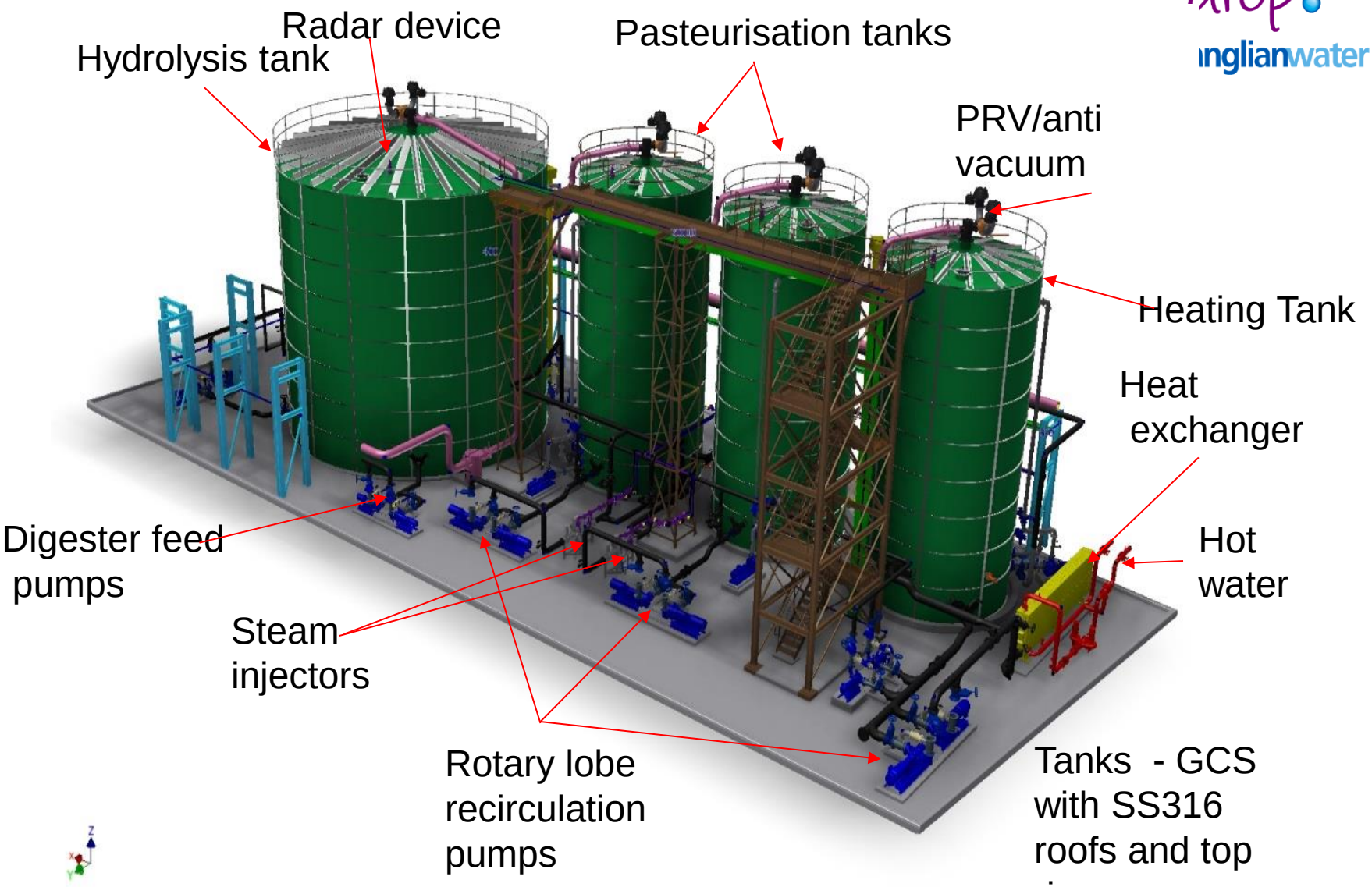
Advanced Digestion Technologies

Anglian Water - HpH Process

- New process developed by AWS and partners
- Patent awarded in July '16
- Biological hydrolysis process
  - Basildon 2013
    - 10,100 tonnes dry solids capacity
    - 2no. 0.6MWe CHP engines
    - AMTREAT Liquor Treatment
  - Cliff Quay (Ipswich) 2013
    - 14,800 tonnes dry solids capacity
    - 2no. 1.2MWe CHP engines
    - AMTREAT Liquor Treatment Plant
  - Colchester 2014
    - 14,900 tonnes dry solids capacity
    - 2no. 1.2MWe CHP engines
    - AMTREAT Liquor Treatment Plant
  - Pyewipe (Grimsby) 2014
    - 16,667 tonnes dry solids capacity
    - 2no. 1.2MWe CHP engines

Colchester STC

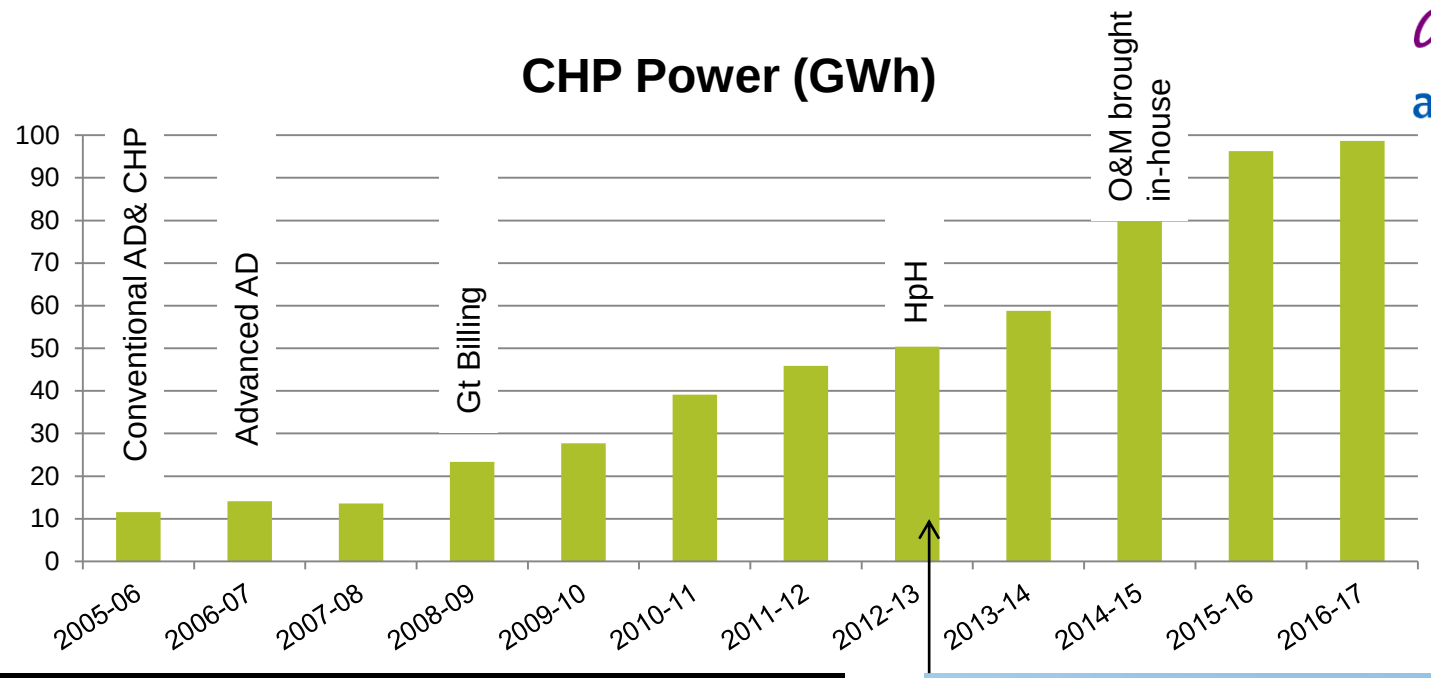
The HpH Process in Detail



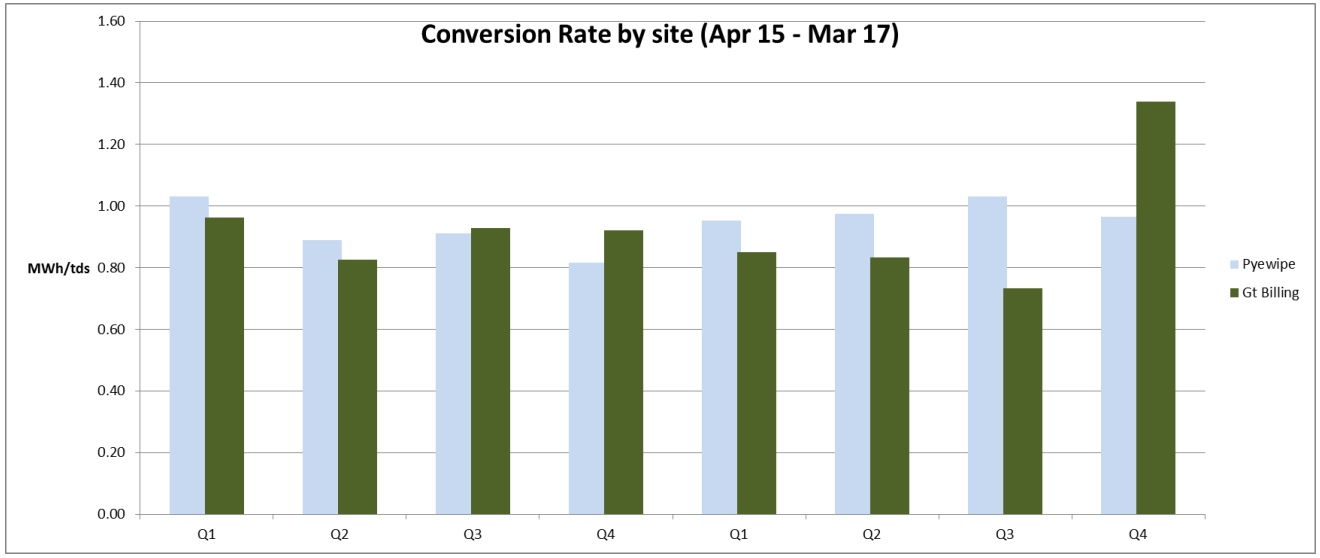
Performance

- 16/17 treated 129.5ttds through our AAD/CHP sites
- Generating a 98.7GWh of electricity via our CHP engines
- Average conversion rate 0.76MWh/tds
- Top performing sites averaging 1MWh/tds

Renewable Generation



Pyewipe & Gt Billing



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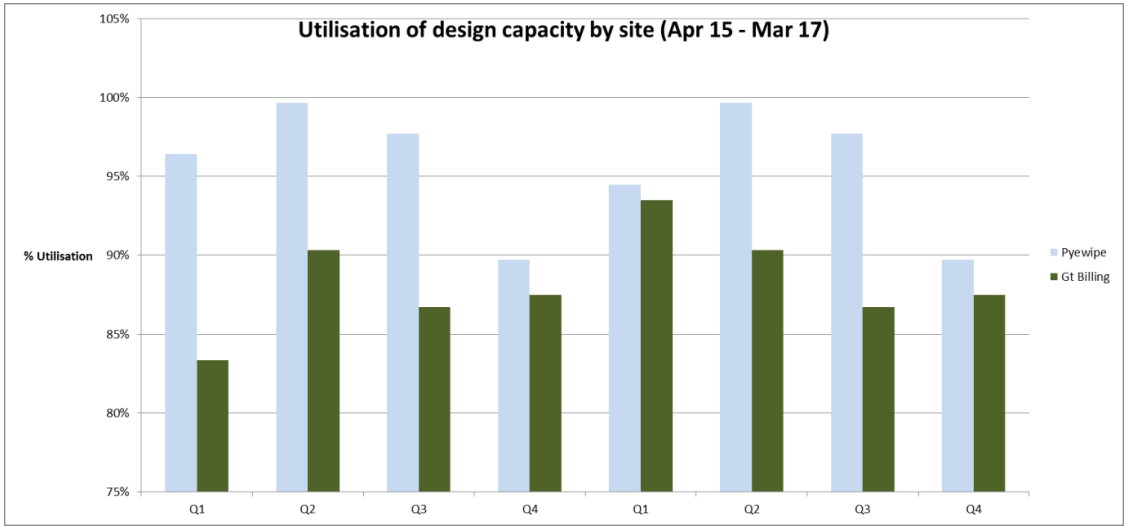
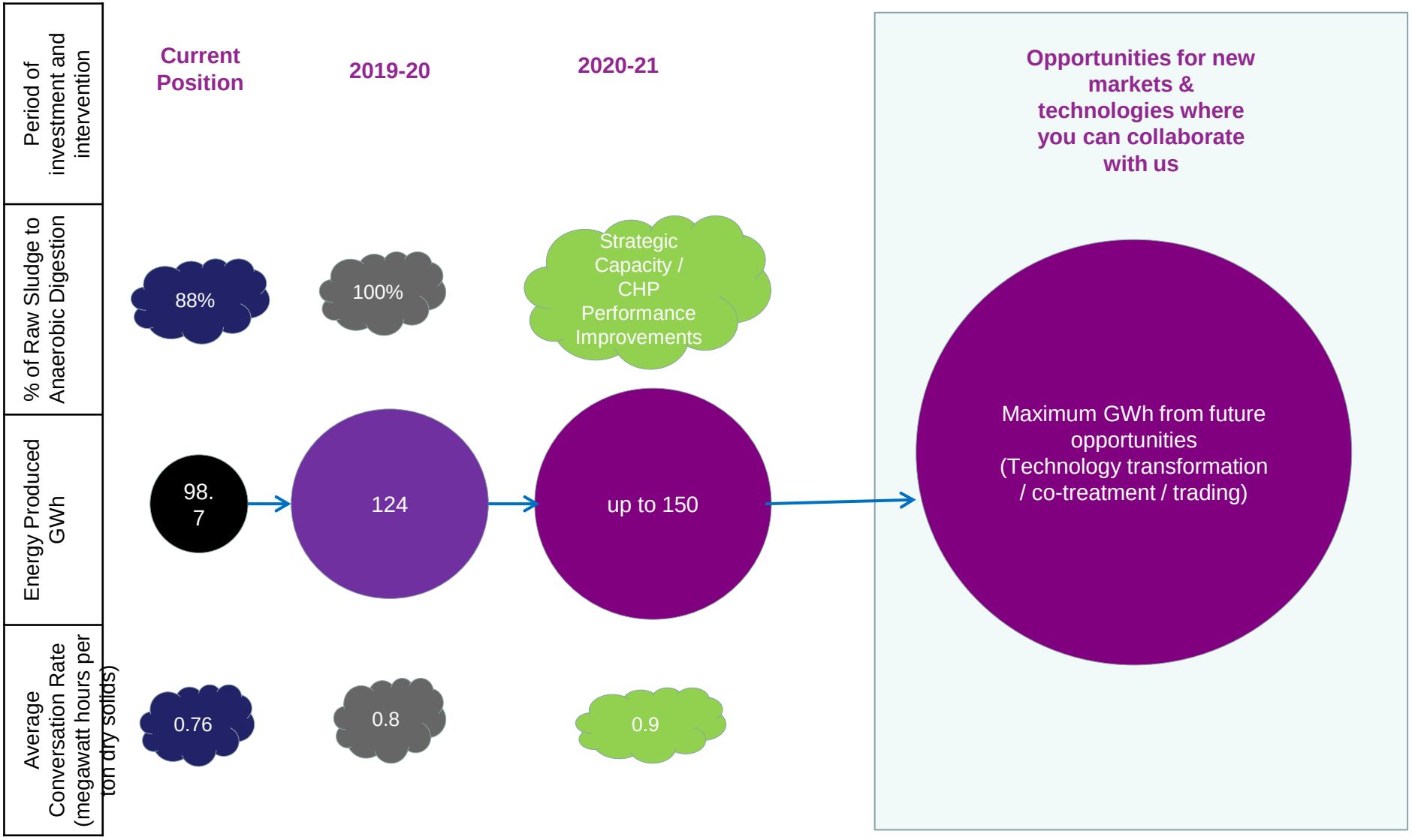
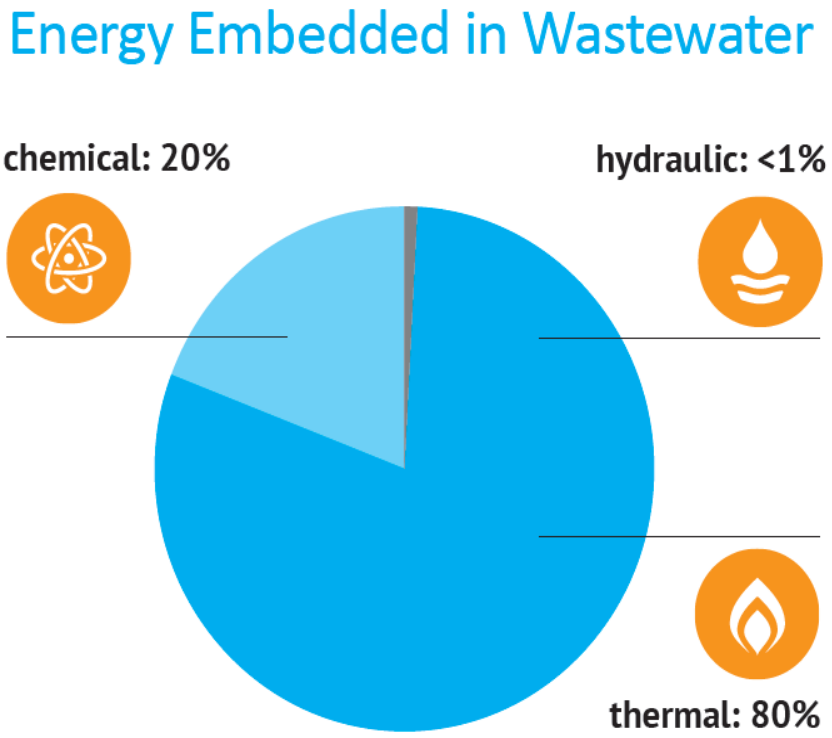


Future Aspirations

Here is a visual of Anglian Water's current output from Combined Heating Power (CHP) and the plans for 2021 and beyond.



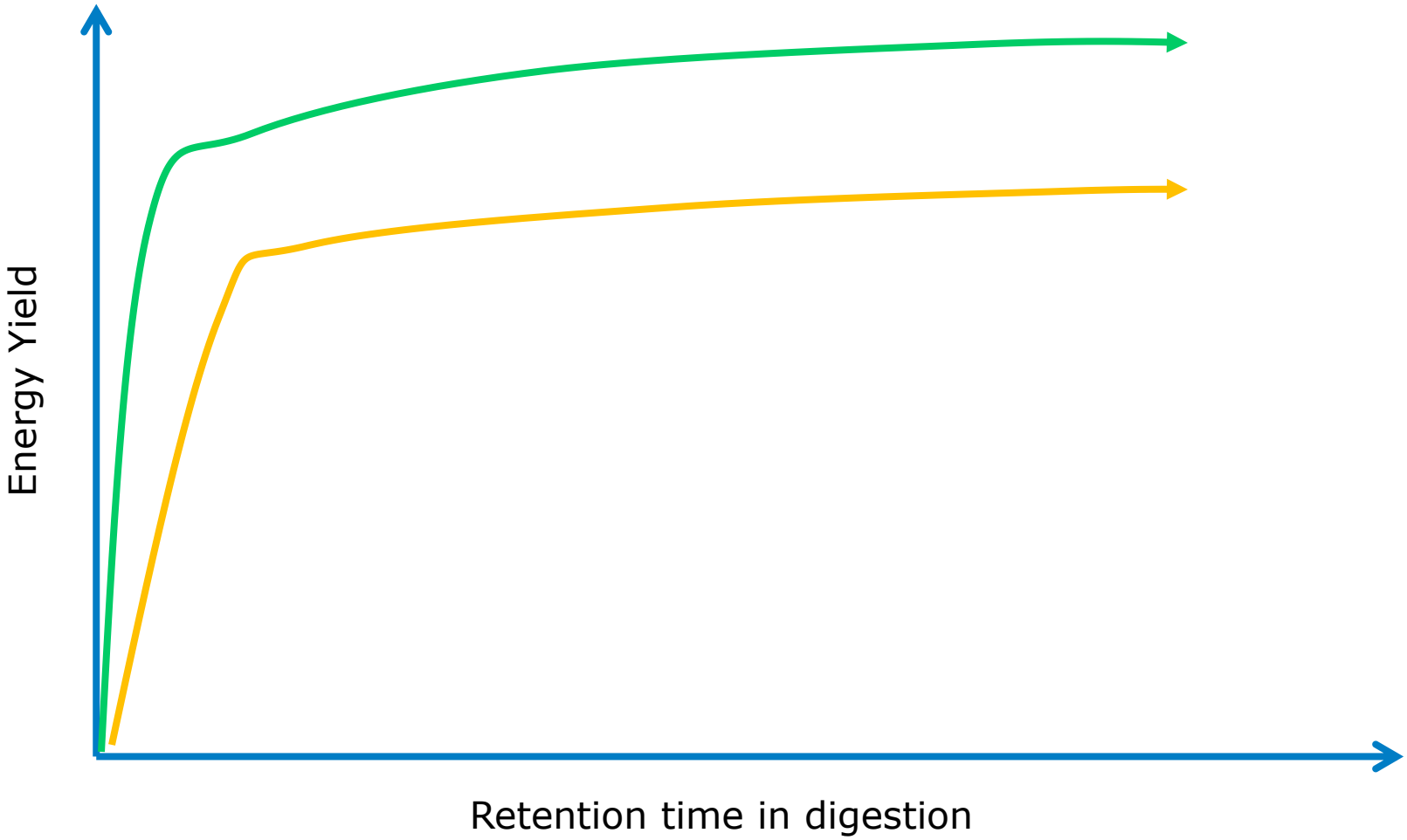
Energy content of sludge



Wastewater contains nearly five times the amount of energy needed for the wastewater treatment process – the majority in the untapped area of thermal energy.

Source: "Utilities of the Future Energy Findings" (WERF 2014) and Newcastle University

More and Faster…



1 MWh (elec)/tds is good isn't it?

Theoretical maximum around 4.7 MWh/tds

- 100% VS reduction, Gas yield 1.05 Nm^3/kg VSR, CV gas 21.5 MJ/Nm^3

Plan for a sustainable and successful future

love every drop
anglianwater

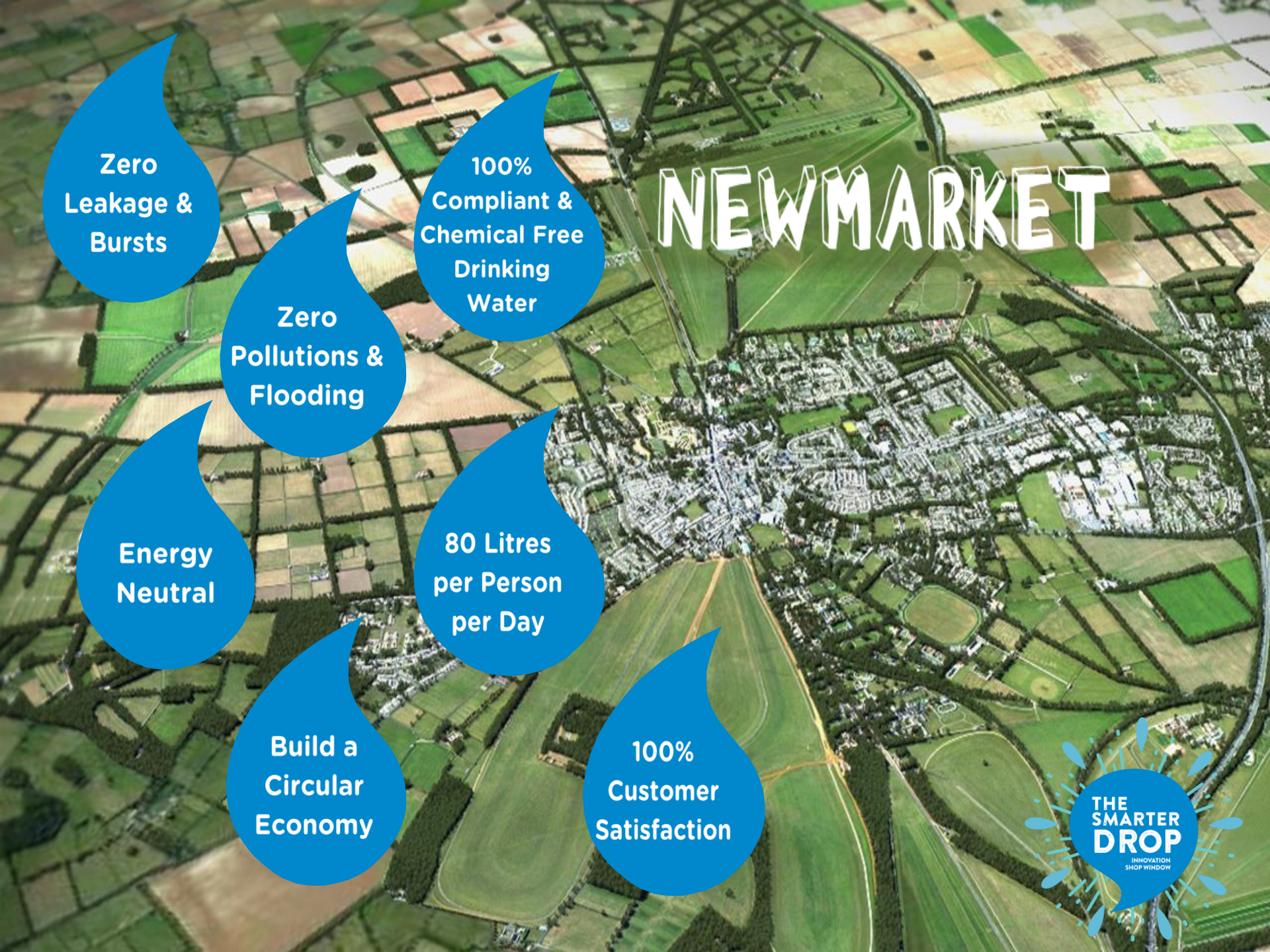
Focus all of our innovative approaches into one live and dedicated catchment

Innovating across the entire man-made water cycle

Unique initiative in a physical, live catchment

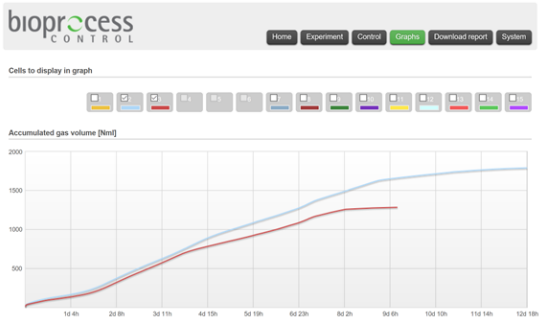
Unlock synergies, learning faster and scaling successes across our region

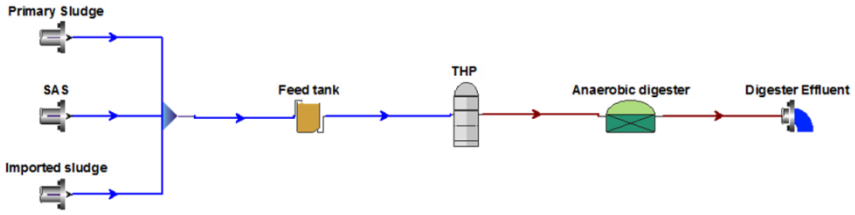
Build a vision of what our future water company could look like…

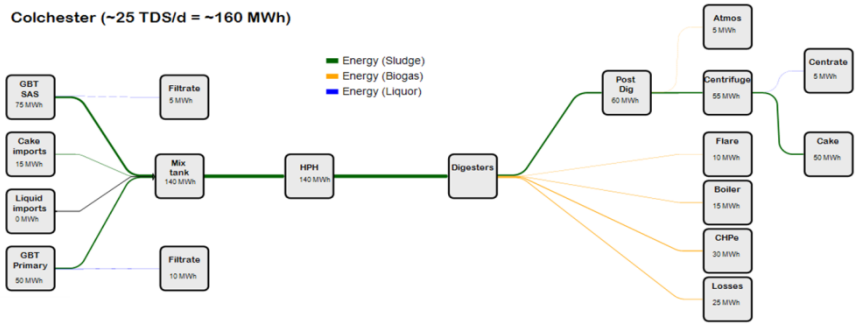

Zero Leakage & Bursts
100% Compliant & Chemical Free Drinking Water
NEWMARKET
Zero Pollutions & Flooding
Energy Neutral
80 Litres per Person per Day
Build a Circular Economy
100% Customer Satisfaction
THE SMARTER DROP
INNOVATION SHOP WINDOW

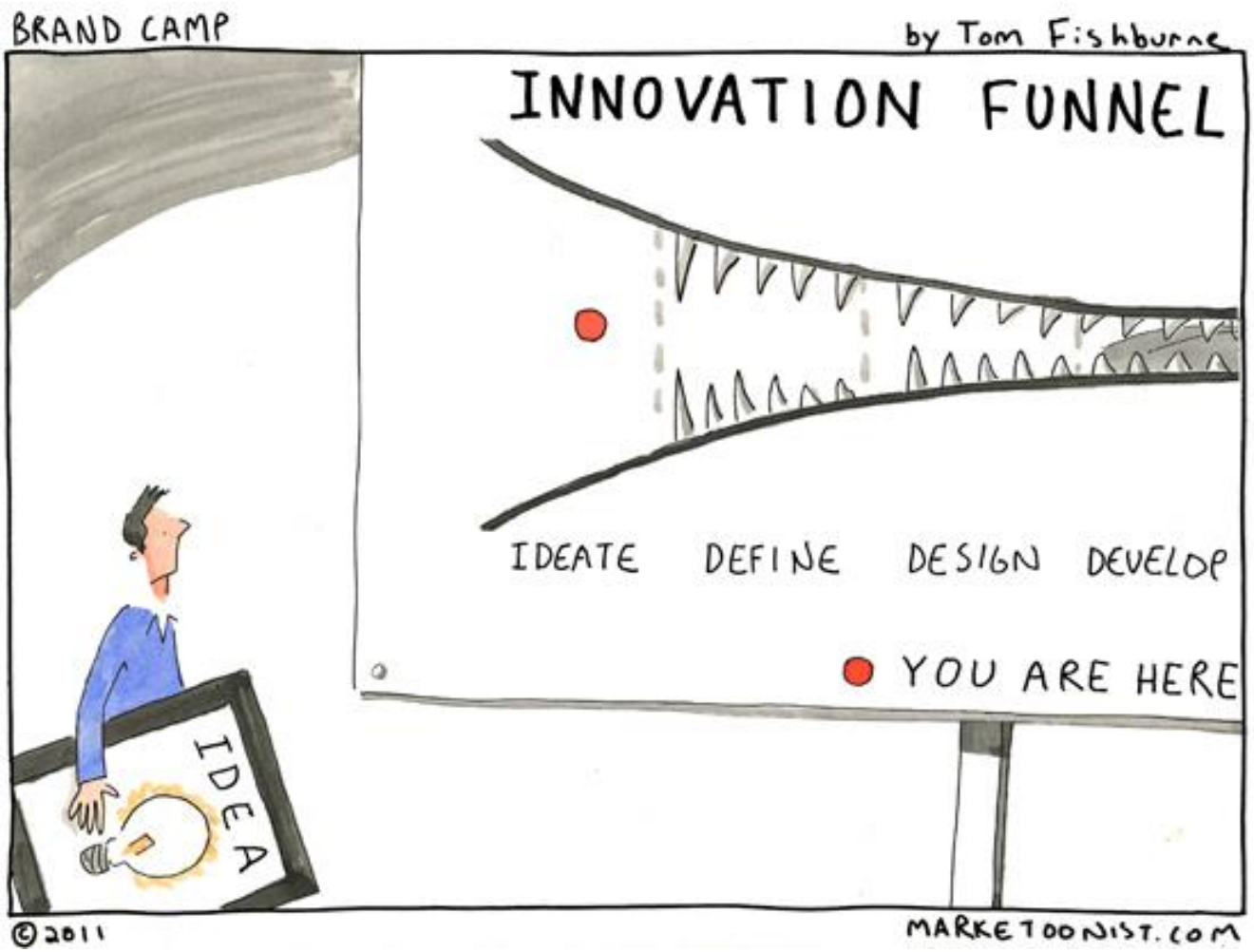
On-going and future work

- Process modelling including VFA speciation and COD fractionation to highlight opportunities and optimisation
- Enzyme addition
- Trace nutrient addition
- Exploring opportunities using synthetic biology
- Appraise thermal processes such as HTC, Pyrolysis and Gasification









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