industriWASE

Independent Brewery Case Study

This case study was done with an independent brewery in the UK that is looking to reduce its environmental impact and brew in a sustainable way both to enhance profitability and benefit the planet.

The Problem

Brewing beer produces a large amount of water and spent grain waste and uses a lot of energy on-site in the process. This brewer currently uses oil boilers during brewing but wants to harness the energy potential of their waste to use the energy on-site instead of wasting it. Adopting a circular approach to waste management will enable them to produce renewable energy on-site and reduce water waste and wastewater discharge costs.

Business As Usual (BAU)

- Pay for off-site wastewater treatment
- Energy bill £90,500
- Use non-renewable energy on-site, and the haulage of waste off-site contributes to carbon emissions
- No value-added from waste

Our WASE

- Save **£95,000 p/a** from waste management
- Save **£82,500 p/a from energy costs**
- 100% of electricity and 73% of heating bill
- Save **484 tonnes of CO_2** saved p/a
- Guaranteed on-site energy production and fixed fees

WASE Proposition

Waste Input

3.2 tonnes/day of Spent Grain

32 m^3/day of Brewery Wastewater

Energy Input

56 kWh/day

Outputs

Net 3,711 kWh/day

CHP Output:

Electric: 1,113 kWh/day

Thermal: 2,598 kWh/day

254 kg/day of biofertilizer

484 tonnes/year of CO_2 saved

Numbers based on using 6 industriWASE Biocentres to treat all spent grain waste and wastewater

The Business Case

The brewery in question would need 6 industriWASE Biocentres to treat all the spent grain and wastewater. The equivalent sized AD system would treat just 1/3 of this waste. Using 6 industriWASE Biocentres, they can:

- Offset 93% of total energy use
- Points towards B-corp accreditation
- Get a Return on Investment (ROI) after **5 years**

WASE has developed two ownership models.

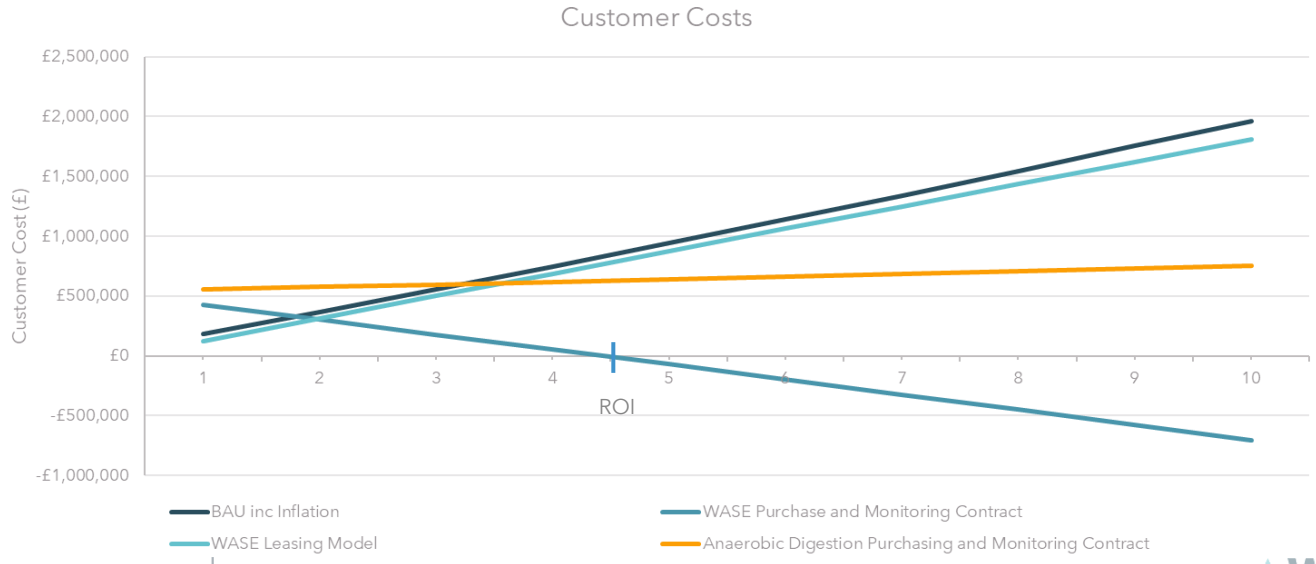
OPTION 1 Purchase & Monitoring Agreement requires an upfront purchase price and a yearly operational cost for maintenance, providing a Return on Investment in 5 years

OPTION 2 Lease Agreement has no upfront costs and gives you instant savings of £56,000 in the first year. The customer pays a set fee per month for the industriWASE Biocentre, which includes maintenance, remote monitoring and use of energy produced.

Pricing Model

	Business As Usual	OPTION 1 Purchase & Monitoring Agreement	OPTION 2 WASE Lease Agreement	AD*
Lifetime Cost (20yrs)	£ 4,185,000	-£ 2,054,000	£ 3,680,000	£ 1,052,000
ROI (years)	N/A	5	Instant	>20
Customer Savings (20 years)	£ 0	£ 2,054,000	£ 601,500	-£ 1,052,000
Upfront CAPEX	£ 0	£ 550,730	£ 0	£ 411,000
OPEX (p/a)	£ 0	£ 61,200	£ 125,424	£ 17,052

* Number based on using the equivalent reactor volume for AD

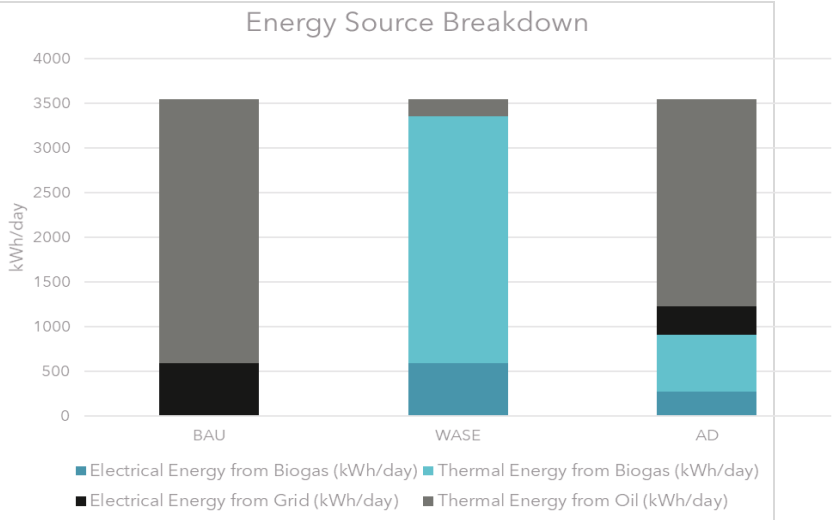


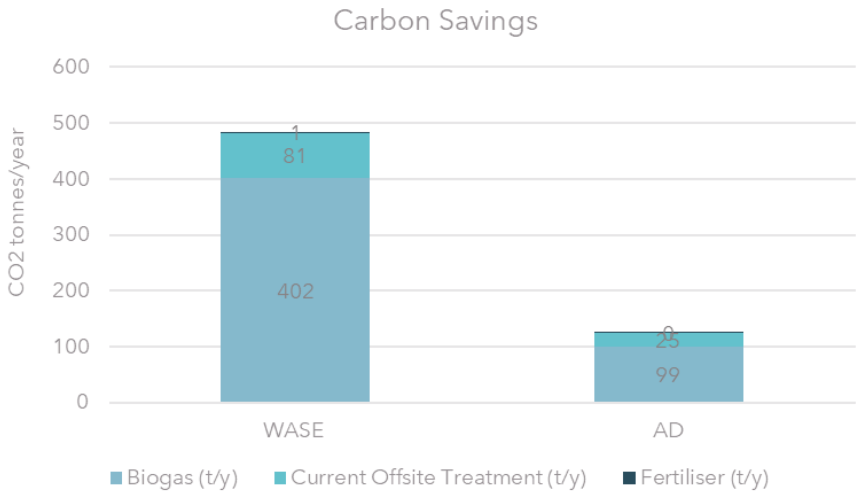
CAPEX	Retail Price
Biocentre	£410,571
Auxiliaries: CHP Unit, Mascerator, Inlet Works, Gas Storage, H_2S Removal	£127,359
Permits	£ 6,750
Shipping + Installation	£6,050.00
Total	**£550,730**

Impacts

The Energy

The industriWASE Biocentre can offset 93% of the total energy consumption currently supplied by non-renewable sources compared to 32% for a containerized AD of equivalent size.





The Environment

A total of 484 tonnes of CO_2 per year is saved using the industriWASE Biocentres. This is achieved by using the biogas produced as an energy source and removing the need for wastewater to be transported off-site for treatment.