

CASE STUDY



Severn Trent Green Power West London AD Facility

West London Anaerobic Digestion (AD) facility treats source segregated food waste from local authorities, commercial waste collectors and food producers/retailers.

Food waste is depackaged, macerated and then digested anaerobically in large sealed tanks. This process produces:

1. Biogas (methane and carbon dioxide): which is converted to renewable electricity in gas engines and exported to the National Grid to power local homes and businesses.

2. Digestate (a nutrient-rich liquid fertiliser): which is spread on local farmland reducing the use of fossil-fuel derived chemical fertilisers.

The excess heat which is produced as a by-product of the process is re-used to warm the digesters and to heat the pasteurisation process.

KEY FACTS

- Construction time: 9 months
- Commissioned: January 2014
- Achieved 100% power: March 2014
- Design power output: 2.4MWe (2 x Jenbacher 416 engines)
- Average power output: 97.1%
- Facility footprint: 2.6 hectares
- Waste input: solid & liquid, packaged and unpackaged food waste
- Digestion retention time: circa 75 days
- ABPR certified
- PAS110 certified
- Digesters: 4 x 4,200m³ tanks
- Digestate storage: 1 x 4,200m³ tank and 20,000m³ off-site lagoon



PERFORMANCE STATISTICS

- Average power output: 97.1%
- Plant availability to date: 100%
- Plant electrical parasitic load: 11%
- Average daily throughput: 145 tonnes solid waste, 90 tonnes liquid waste
- ABPR certified
- PAS110 certified
- Staff: 1 manager, 2 operators

ENVIRONMENTAL BENEFITS

- Diverts solid food waste from landfill
- Diverts liquid organic waste from water treatment works (saving energy)
- Captures 4.5 million m³ of methane every year – the same greenhouse gas impact as removing 71,000 cars from the road
- Generates enough renewable electricity to power over 4,800 homes
- Uses liquid waste and rainwater to minimise process water usage
- Low on-site energy consumption
- Constructed from 52% recycled aggregates
- Concrete hardstanding area minimised to reduce the carbon footprint
- Our digestate replaces fossil-fuel derived fertilisers on around 2,500 acres of farmland
- Waste heat from gas engines is recycled into the digestion and pasteurisation processes, optimising plant energy use

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DESIGN BENEFITS

- Long retention times = more biogas produced, stable biology, reliable treatment service and low odour digestate product
- Robust depackaging system = highly effective, maximises plant recycling rate, reliable, able to process peak waste deliveries (10–20 tonnes/hr)
- Single stage depackaging process = low power usage, low maintenance
- Recessed reception bunker = biosecure, ABP best practice, increased temporary waste storage capacity
- Three days of food waste storage capacity pre-digestion = able to process peak waste deliveries
- No digestate dewatering = reduced energy usage, lower operating costs, maximised nutrient recycling to land
- Enclosed, odour-controlled waste reception building = low external odour
- Wet scrubber and biofilter on building ventilation system = low external odour
- One-way traffic system = improved site safety, quick turnaround times
- Two automated weighbridges; site entrance and site exit
- Concrete tanks cast in-situ for longevity

DIGESTATE STATISTICS

- NPK values (kg/m³): 5kg N (60–80% ammoniacal-N), 0.52 kg P₂O₅, 2.17 Kg K₂O
- 50,000 tonnes 'whole digestate' spread on local farmland each year