



CROP-FED ANAEROBIC DIGESTION PLANT

Project: Upgrade, expansion and operation

Client: Ingenious

Location: Manor Farm, Paulerspury

Size of plant: 350 Sm³/h (excluding propane) and 500 kWh

Energy: Biomethane grid injection and CHP output

Purpose: Crop-fed Anaerobic Digestion plant

Feedstock: Maize and rye

Operator: Agrivert



Agrivert assumed responsibility for Manor Farm in 2019. The owners are fully committed to the plant and asked Agrivert to make recommendations to improve the infrastructure and the routine operational management to ensure maximum plant output and efficiency.

The plant output increased from 35% average output to 98% output in the 18 month period the upgrades took place.

MAIN UPGRADES

Agrivert quickly identified that electrical grid export and import capacity could be increased. This key upgrade allows the plant to operate at maximum capacity.

Agrivert's review identified several enhancements to ensure the plant would operate at full output.

These enhancements included:

- Upgrading the feed pipe system to a larger diameter pipe and rerouting to remove numerous right angles to improve flow
- Upgrading all the hydraulic rams on both feed bunkers to deliver better uptime from the bunkers
- Fitting biogas condensation removal prior to the biogas upgrading plant (BUP), which has lengthened the lifespan of the biogas compressor
- Fitting variable speed drives (VSD) to gas compressors in the BUP to prevent tripping
- Upgrading the mixing systems to add paddle mixers to improve resilience and eliminate crusting
- Changing the use of black water to reduce fibre recirculation
- Improving the SCADA system to add more alarms and better out of hours control and intervention
- Adding black water storage
- Introducing air-conditioning into the plant room to prevent overheating of electronic componentry
- Upgrading drainage to a larger gauge to prevent flooding
- Several changes were made to improve and regulate the temperature control in the digesters

For all the above, Agrivert conducted the diagnostic, designed the new solution, procured the componentry and installed the upgrades.

OPERATIONAL CHANGES

Agrivert was fortunate to inherit a capable and motivated Plant Manager, and with him, Agrivert initiated several changes to drive the plant's performance.

These included:

- Improving feedstock quality management. Acceptance criteria was carefully monitored, and a focus on better storage was introduced
- A review of critical spares was conducted, and stock levels were increased. This allowed faster rectification of unplanned and planned maintenance
- Daily KPI reporting allowed faster and more urgent escalation of issues with senior managers monitoring daily KPIs
- A complete review of the nutrient monitoring and control to ensure optimum nutrient balance
- The SCADA upgrades allowed swifter response to out-of-hours issues
- The management structure was strengthened to support the plant management team to diagnose and resolve problems

EXPERTISE

Agrivert's unparalleled engineering and operational experience are delivered by a team of agile and creative engineers and operators. As a result, Agrivert can deliver complex facilities on time and within budget.

CURRENT SITUATION

Today most upgrades are complete, with just a further cooling system to be installed. Agrivert are also adding two additional silage clamps reducing the need for AG bags and doubling the digestate storage capacity by adding 10,000 m³ of storage capacity.

Manor Farm is now consistently running at close to 100% output.