

Expert engineering and operating solutions
for your organic waste management challenges



UPGRADING TORNAGRAIN GAS MILL

Project: Upgrade and operation

Client: Ingenious

Location: Tornagrain, Inverness

Size of plant: 450 Sm³/h (excluding propane) and
500 kWh

Energy: Biomethane grid injection and CHP output

Purpose: Crop-fed Anaerobic Digestion plant

Feedstock: Grass, rye and draff

Operator: Agrivert



Agrivert assumed responsibility for Tornagrain Gas Mill 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.

MAIN UPGRADES

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

These enhancements included:

- Fitting variable speed drives (VSD) to gas compressors in the BUP to prevent tripping
- Reduce export limit on CHPs, allowing maximum revenue to be generated from CHPs
- Fitted a generator which was critical given the unreliability of the local electric network
- Upgraded the fibre separation system removing more fibre prior to liquor recirculation
- Upgrading the mixing systems to add paddle mixers to improve resilience and eliminate crusting
- Enlarging the gas pipes between the digesters to allow swifter balancing of pressure between tanks and reducing unnecessary loss of gas from PRVs
- Improving the SCADA system to add more alarms and better out of hours control and intervention
- Introducing air-conditioning into the plant room to prevent overheating of electronic componentry
- Adding two new silage clamps removes the need to ag bag silage, improving the feedstock quality while reducing cost
- 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.

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.

OPERATIONAL CHANGES

Agrivert initiated several changes to drive the plant's performance.

These included:

- Removal of problematic manure feedstocks which were often contaminated with stones and twine and were causing significant damage to equipment and downtime. This has been replaced with draff
- Improving feedstock quality management. Acceptance criteria was carefully monitored and a focus on better storage was introduced
- 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 diagnostics/diagnosing/diagnosis and to resolve problems
- 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

CURRENT SITUATION

Today most upgrades are complete, and Tornagrain Gas Mill is now consistently running at close to 100% output.