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Cog Moors Welsh Waste Water Treatment Off-site Manufacture Case Study

Providing an off site manufactured fully modularised package plant room to generate steam for a Thermal Hydrolysis plant at Cog Moors Waste Water Treatment facility.

Project context

Have you ever wondered what happened to human effluent? On wastewater treatment sites human waste (sludge) is often heated in digesters to generate biogas - providing a potentially infinate free source of energy. Cambi have designed a system which generates 1/3 more biogas from the same effluent. The thermal hydrolysis plant (THP) uses steam to boil the sludge to destroy pathogens and increase biogas yield.

The customer opportunity

- On site at Cog Moors, Welsh Water wanted to use the biogas to feed into CHP engines to generate electricity.
- They also had a need to use low grade heat from the engines preheat the feedwater to the boilers.
- Welsh water has an off site manufacturing policy which requires them to build 75% of their equipment off site.
- WW chose Dunphy as a partner to provide a full design and manufactured off site built plant room to generate the steam required for the process

Our approach

We offered a turnkey solution: a fully modularised plant room built at our facility in Rochdale, transported, then installed on site within 5 days.

1 - Design

In house engineering design team

2 - Manufacture

Manufactured at facility in Rochdale

3 - Test

Full factory acceptance test

4 - Deliver

Modules delivered to site

5 - Install

Full installation by our team

6 - Commission

Finalised by our engineers on site

Our solution

- We provided a solution wth 2 composite boilers
- These generate 4 tonnes of heat from the fired site and the waste heat from the CHP engine exhaust is ducted through the boilers to generate an additional 1 tonne of heat from the waste heat side.
- Economisers on both the waste heat and fired sections are used to preheat the feed water.
- The low grade engine heat is used to preheat feedwater
- The burners are triple fuel (biogas, natural gas and diesel) allowing for redundancy and to ensure that the most cost effective fuel is used.
- The biogas is used in the boilers instead of nat gas or diesel if the CHP engine is down.
- Ahead of delivery, Dunphy conducted a full factory acceptance test, during which results were shared with the client, including visibility of specified turndown, modulation, output, combustion efficiency and emission levels.

Benefits

Biogas emissions at <55mg/m3 @ 3% Oxygen

Natural gas emissions at <85mg/m3 @ 3% Oxygen

Expected plant life expectancy of over 30 years

Customer feedback

"The hard work and dedication that went into this off-site manufacture was truly remarkable. It required meticulous planning, precision engineering, and innovative design to create high-quality products in a controlled environment. A master class in off-site manufacture."
Andrew Bowen, Skanska

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