

PROCESS

EfW confident with proven biogenic CO₂ sampler

INTRODUCTION

A highly modern and efficient Energy from Waste plant in Plymouth processes up to 265,000 tonnes of household, commercial and industrial residual waste.

It generates electricity as well as usable heat in combined heat and power (CHP) mode, thereby saving valuable fossil resources and reducing carbon dioxide output.

BACKGROUND

Carbon dioxide (CO₂) emissions combusted in Energy from Waste sites are among the leading factors which contribute to global warming. With the world attention of achieving net-zero targets within decades, the measurement of biogenic carbons has come into focus.

The Renewable Obligation (RO) scheme, regulated by Ofgem, requires licensed electricity generators to source an increasing proportion of the electricity from renewable sources - in this case biogenic CO₂.

For their part to prove that these renewable obligations have been met, EfW operators are heavily incentivised to prove the fraction of biogenic CO₂ emissions. Operators obtain Renewable Obligation Certificates (ROCs) which are traded when the energy price is high.

To be eligible to obtain ROC's, the operator must prove biogenic content is at 50 % or greater.

To be able to report biogenic CO₂, operators must understand how to measure it.

The 14C method provides the most accurate and cost-effective way for quantifying biogenic CO₂ emissions.

PROBLEM

Previously, the site operated a bespoke built sampling system utilising wet chemistry. This system was loosely based on the EN 13833 standard. The first problem is that the manual system isn't aligned with the standard and therefore isn't fully representative of the feedstock because there were just 22 sampling periods per month.

Secondly, it wasn't automated and therefore, required the operatives to take the sample which had a negative bias.

Ultimately, the plant was unable to confidently report accurate results.



AMESA-B

Monitoring for Powder, Dust & Gas

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SOLUTION

The AMESA-B was trialed as an upgrade to current sampling methodology.

CUSTOMER BENEFITS

- Provides full compliance with the EN standard
- Technologically advanced in comparison to the current system
- Continuous and therefore fully representative of the feedstock.
- Fully automated and requires no intervention (other than the technicians to replace sample cartridge monthly).

Finally, it can be configured into plant DCS to come online / offline when burners on / off command is initiated either manually or in auto and when the feed chute open / shut command is given.

Data is stored and later downloaded to capture plant data which aids analysis in that the concentration of the sample is proportionate to the flow passed through it.

At the end of each month, the samples from each test rig are collected, processed, and sent to an analytical laboratory which is accredited according to ISO 17025 for the ¹⁴C analysis of such samples according to EN 13833.

The laboratory results give the plant operator what they need to submit to Ofgem to obtain ROCs.



RESULT

The 18-month AMESA-B trial was successful in terms of consistent results. Now confident with the sampling method and stability of results, the plant can confidently report their biogenic CO₂ fractions greater than 50 % within a variation of 5 % (depending on waste loading) to Ofgem.

This has, therefore, had a positive financial impact on the qualification of ROCs.

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