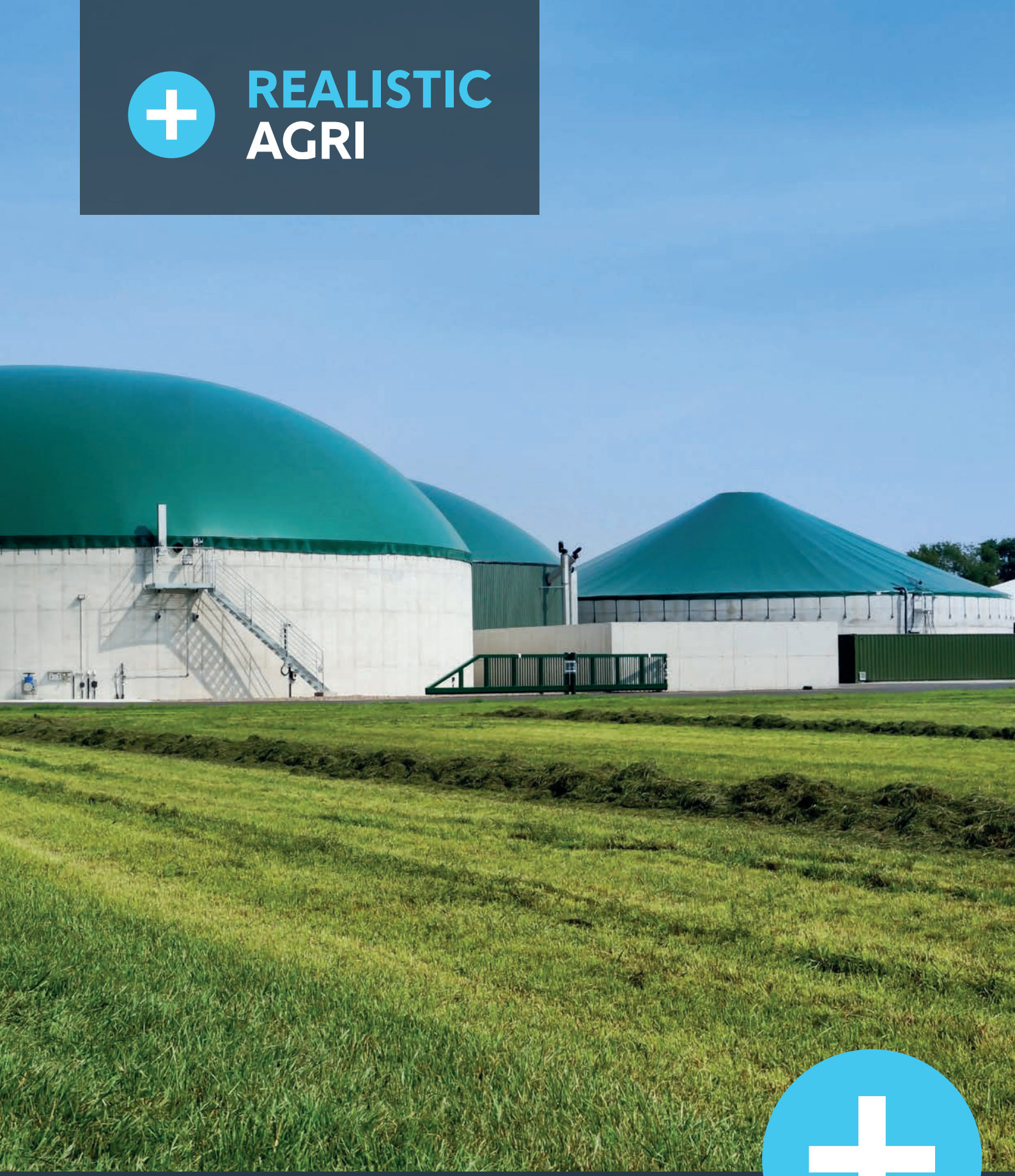
REALISTIC
AGRI



# BIOGAS PERFORMANCE ENHANCERS

# MAXIMISE SUSTAINABILITY AND PROFIT.

**The return on investment from your biogas plant critically hinges on a well-balanced fermentation process for optimal breakdown of feedstocks, leading to higher methane production and better overall efficiency and output.**

A stable fermentation environment not only maximises returns on investment, but also minimises the risk of process failures, reduces operational costs, and enhances the sustainability of the biogas system.

By maintaining an efficient fermentation process, biogas producers can enjoy a more environmentally and financially sustainable future.

To help you achieve this, we offer a range of additives designed to maximise performance and energy production, enabling you to get more from less.

## ABOUT US

From field to feed, **REALISTIC AGRI** brings over 20 years of expertise in the agriculture value chain, offering comprehensive silage solutions.

These solutions include high-quality oxygen barrier films and silage covers to protect yields, silage additives to maximise efficiency, ruminant nutrition for high-performing livestock, and biogas plant additives for optimal fermentation and gas production.

**We are dedicated to making sustainability REALLY sustainable!**

REALISTIC AGRI

## OUR PARTNERS

**REALISTIC AGRI** are exclusive distributors of **METHODO** biogas products.

Based in Italy, Methodo Chemicals is Positive Energy, a family run, independent business.

Established in the 1980s, **METHODO** sells raw materials and additives for the animal feed and dietary supplement industries.

During the 1990s the company built its own production plant for making premixes and complementary feed.

Today, **METHODO** manufactures a range of specific supplements to optimise the management of biogas plants.

METHODO® CHEMICALS

# CONTENTS

# TRACE ELEMENT SUPPLEMENTS

GAS PRODUCTION OPTIMISATION

Trace elements are vital for optimising the anaerobic digestion process, enhancing microbial activity, stabilising biogas production, and ensuring the efficiency and longevity of AD plants. The **OLIGAS** range is available in standard liquid or powder blends, or a customised package that is specially formulated to optimise your individual digester performance.

**Contents:** Concentrated trace elements.

**Mode of Action:** Essential trace elements optimise the fermentation performance. The chelated salts are immediately available for methanogenic bacteria. The special formula speeds up the methanogenic bacteria's use of the accumulated volatile organic acids.

The **OLIGAS** range is suitable for use in any type of plant.


## INTEGRA

**Liquid blend of essential trace elements**

**Pack size:** 25L drums and 240L barrels.

**Dosage:** 0.2L/day every 100kW. Being a liquid product, it can be introduced directly in the fermentation system, pre-feed tank, or on the biomass.

## OLIGAS

**Liquid or powder tailor made for your individual plant.**

Each plant has different feedstocks and feeding features. **OLIGAS** is a tailored supplement of concentrated trace elements that targets and resolves specific deficiencies, to optimise fermentation performance in your individual plant.

- Recover production rapidly in the event of poor production or acidosis.
- Fully customised – analysis and quarterly inspections, tailored dose plan.
- Optimise consistent performance.
- Liquid or powder feeding.

The **OLIGAS** production process includes the following steps:

- Concentrated formula means weekly rather than daily feeding.
- Powder blends are packed in biodegradable paper bags so there is no need to measure and no spillage.
- Analytical evaluation and consultation service provided by professional biologists to identify critical deficiencies that can affect the process.
- Supplementation of the required trace elements to solve the detected deficiency.
- Quarterly, six-monthly, or yearly supplementation plan with weekly doses.
- Regular testing of digestate to confirm or change the formulation.

## RIMEDIA

**Powder blend of essential trace elements.**

Dosed in a biodegradable bag at regular intervals, the operator can easily handle and introduce the blend in the bag as is.

**Pack size:** 2.5 or 5kg biodegradable bags.

**Dosage:** In the event of VFA accumulation that can compromise the fermenter's biology, ranges from 2.5 to 5.0kg/day every 100kW until the problem is solved.

# SULPHUR CONTROL

QUALITY

OPTIMISATION

## IRON OXIDE

**For daily use to aid the reduction of the hydrogen sulphide ($H_2S$) contained in biogas.**

- Lowers the $H_2S$ concentration in biogas reducing the need for further removal.
- Prevent inhibitions to the biological process by increasing the iron concentrations in the fermenter.

**Contents:** Ferric oxide-based product ($Fe_2O_3$) in very fine powder form.

Recommended for installations that require high amounts of iron to stabilise the biological process and at the same time to reduce the $H_2S$ in biogas.

**Pack size:** 1100kg pallets in 25kg biodegradable paper bags.

**Dosage:** To be added daily into solid loading system or in the premix tank with or without the water-soluble packaging.

## IRON HYDROXIDE

**For regular use to aid the reduction of hydrogen sulphide ($H_2S$) contained in biogas, or for fast action to control spikes of $H_2S$ in biogas.**

- Lowers the $H_2S$ concentration in biogas reducing the need for further removal.
- Prevent inhibitions to the biological process by increasing the iron concentrations in the fermenter.

**Contents:** Ferric hydroxide (FeO(OH)) in powder form.

Ferric hydroxide-based product (FeO(OH)) recommended for installations that require high amounts of iron to stabilise the biological process and at the same time to reduce the $H_2S$ in biogas.

**Pack Size:** 1000kg pallets in 20kg biodegradable paper bags.

**Dosage:** Can be added daily into solid loading system or in the premix tank with or without the water-soluble packaging.

## METHO-FILTER

**An alternative to Activated Carbon designed for the filtration of biogas and the removal of hydrogen sulphide in the biogas.**

- Has a greater $H_2S$ filtering capacity than a normal activated carbon.
- Spent product can be utilised in the biogas plant, eliminating disposal costs.

**Contents:** Iron hydroxide pellet [$Fe(OH)_3$] 2 – 8mm and 5 – 25mm in size. Add 20% – 30% large pellets to the base of the vessel and top up with smaller pellets.

**METHO-FILTER** prevents damage to the mechanical components of the CHP unit and can extend the oil change time of the co-generator.

**Pack size:** 2 – 8mm in 550kg Big Bags; 5 – 25mm in 25kg bags.

# AMMONIA CONTROL

GAS PRODUCTION OPTIMISATION

## METHO-DETOX

**Ideal for plants with alkalosis problems, or fed with chicken waste or products high in protein, METHO-DETOX controls ammonia and promotes bacterial metabolism, enhancing plant performance.**

**Contents:** A mixture of zeolites and natural extracts that reduces the toxic effects caused by ammonia accumulations. Based on a vegetable/mineral mixture.

**Mode of action: METHO-DETOX**, exploits the selective ion exchange with ammonium ions, allowing the sequestration of ammonia, thus reducing the quantities of free ammonia. Furthermore, plant extracts increase bacterial resistance to high concentrations of salts which occur with the use of large quantities of external recirculation, manure, livestock waste and the organic fraction of urban solid waste.

- Reduce the toxicity of ammonia nitrogen.
- Improve biogas production in cases of strong alkalosis.

**METHO-DETOX**, thanks to the combined action of its minerals, vegetables, and micro elements, increases the resistance to osmotic stress of bacteria and allows the reduction of the toxicity of free ammonia, favouring bacterial metabolism in both the hydrolytic and methanogenic phases, improving the performance of the system.

**Pack size:** 20kg biodegradable paper bags.

**Dosage:** Depends on a digestate analysis, please enquire for details.

## RAL-DETOX

For daily use to control free ammonia in biogas plants.

Like **METHO-DETOX**, **RAL-DETOX** is used daily to control free ammonia in biogas plants.

- **RAL-DETOX** removes $NH_3$ and $NH_4$ by means of ion exchange.
- **RAL-DETOX** is a 100% highly effective form of zeolite.

**Pack Size:** 25kg biodegradable bags.

# SUBSTRATE BREAK DOWN ENZYMES

SUSTAINABLE OPTIMISATION

## COMBIZYME

Increases the plant's efficiency, owing to its broad-spectrum activity, reducing hydraulic residence times and speeding up disaggregation.

- Reducing feedstock use by up to 10%.
- Reduce mixing time and viscosity of the digested material.
- Eliminate pumping problems.
- Reduce parasitic electricity load by making pumping easier.

**Mode of Action:** Contains the enzymes necessary for speeding up plant cell disaggregation, hydrolysing all the main complex molecules, making the cell contents 100% available, which are then quickly converted and metabolised by the bacteria involved in the anaerobic digestion process.

**COMBIZYME** is ideal for biogas sites of any size that:

- Require large amounts of plant biomas.
- Use animal wastes.
- Have short hydraulic residence times.
- Use silage.
- Use materials high in fibre.

**Pack size:** 25kg. To be added daily as is to the solid matter feeder or pre-feed tank.

**Dosage:** 100g per tonne of organic matter fed into digester daily.

## ENERPLUS

An optimal enzyme blend for all biogas and biomethane plants that are feeding silage, bedding, FYM and animal waste as feedstocks.

- Reduce feedstock use by up to 15%.
- Reduce the mixing time and electricity consumption.
- Eliminate pumping problems.

**Mode of Action: ENERPLUS** contains lyophilized enzymes with high concentration and high purity. These enzymes speed up the breakdown of plant cells by making 100% cell content available for the bacteria responsible for methanogenesis.

Ideal for use to improve production in biogas and biomethane plants fed with high amounts of silage, poultry litter and manure, slurries and FYM.

**Pack size:** 5kg or 2.5kg bags.

**Dosage:** 5kg/day for 1mW plant or 2.5kg/day for smaller plant.

## RE-SOLVE

An aggressive blend of enzymes to break down substrates but with added polymers that homogenise floating layers into the liquid fraction.

- Combines the actions of **ENERPLUS** and **METHOGAS** in a single product.

**RE-SOLVE** counteracts the problems of crusts and sediments in the fermenters and at the same time improves the degradability of the fibre present in the feed.

**Pack size:** 2.5kg and 5kg biodegradable bag.

# DEFOAMING

GAS PRODUCTION QUALITY

## METHOFLOW

Foaming in AD plants compromises efficiency, safety, and profitability, making its prevention and control critical for optimal plant operation.

**METHOFLOW** removes and prevents foaming inside the fermentation system.

Recommended for any type of foam:

- Mainly fed with acid waste.
- Fed with waste rich in fats.
- Containing a high concentration of ammoniacal nitrogen.

**Contents:** Fatty alcohols and ethoxylated derivatives.

**Mode of action:** Helps reduce the surface tension in the fermented liquid, thereby allowing gas to quickly exit the liquid faction.

**METHOFLOW** is 100% biodegradable, thanks to the absence of silicone agents, which makes it safer to use.

**Pack size:** 25L drums or IBCs.

**Dosage:** 2g to 20g/m³ of digestate or in the fermentation system or tanks, depending on the amount of foam.

**METHOFLOW** must be introduced into the tank or the fermentation system from above, directly on top of the foam. To make this operation easier, you can dilute in water to obtain a 10% solution.

### Foaming in anaerobic digestion (AD) plants is problematic for several reasons:

- **Reduced Efficiency:** Foam can occupy significant volume in the digester, reducing the effective capacity for biogas production. This leads to lower overall efficiency and reduced methane yields.
- **Operational Issues:** Foam can clog pipes, pumps, and other equipment, leading to operational disruptions and potential damage. This increases maintenance requirements and can cause downtime.
- **Process Imbalance:** Foaming can indicate an imbalance in the microbial community within the digester. This imbalance can disrupt the anaerobic digestion process, further reducing efficiency and biogas quality.
- **Health and Safety Hazards:** Foam can lead to the release of harmful gases, such as hydrogen sulphide, which pose health risks to workers. Additionally, foam overflow can create hazardous working conditions around the plant.
- **Energy Losses:** Foam can trap biogas, preventing its efficient capture and utilization. This results in energy losses and decreased profitability of the biogas plant.
- **Increased Costs:** Managing and mitigating foam formation incurs additional costs, including the use of antifoaming agents and increased labour for cleaning and maintenance.

# CRUST CONTROL

GAS PRODUCTION QUALITY OPTIMISATION

## METHOGAS

Crust control is vital for maintaining optimal efficiency, safety, and cost-effectiveness in AD plants, ensuring smooth and continuous biogas production.

**METHOGAS** is a combined action product that makes the digestate more homogenous and less viscous. It increases the activity of hydrolytic enzymes to increase digestibility of fibres and enhance methanogenic reactions.

- Remove superficial crusts.
- Remove build-ups form the bottom of the fermentation system.
- Reduce parasitic load.
- Significantly reduce problems conveying digestate.
- Facilitate pumping and the separation of solids from liquids.

**Contents:** Polyamines (electrically charged polymers).

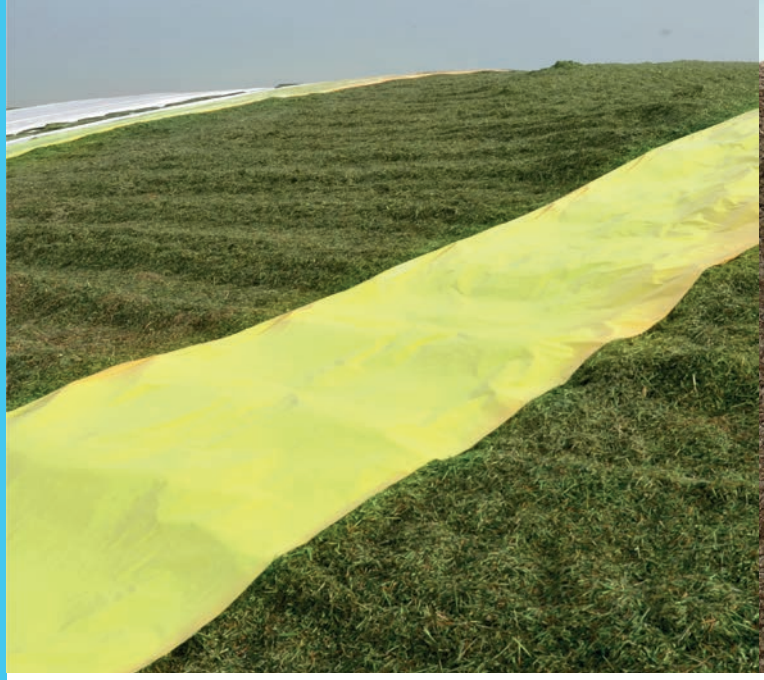
**Mode of Action:** Increases the activity of hydrolytic enzymes, which occur naturally in the fermentation system, thereby promoting and catalysing the bond between the enzymes and their fibrous substrate.

**METHOGAS** increases digestibility of fibres of slow fermentation biomass, which would require long HRT. It also enhances methanogenic reactions, promoting methanogenic bacteria proliferation and metabolism. This combined action makes the digested product more homogeneous and less viscous.

**Pack size:** 15kg bags.

**Dosage:** Initial dose: 45kg/week/mW; subsequent maintenance dose: 15kg/week/mW.

The daily or weekly dose must be agreed in consultation with your **Realistic Agri** advisor, as it depends on feeding and mixing systems, volumes, and the extent of the problem.



# AD SILAGE PRODUCTS

QUALITY

SUSTAINABLE

## REALISTIC ENERGY

**A silage additive for the protection and enhancement of your biogas forage.**

**Realistic Energy** is a biological silage inoculant based on three highly active natural lactic acid bacteria, for the protection of forage energy and enhanced forage digestibility.

**Mode of Action:** The combination of the three strains of lactic acid bacteria (both homo and heteroermentative) provides a particular metabolic synergy that ensures energy crops are preserved more rapidly for biogas energy production.

With good ensiling technique and accurate dosing, after only two weeks, **Realistic Energy** creates an aromatic silage with good biogas producing characteristics and minimal losses.

**Realistic Energy**, through fast production of acetic acid will:

- Enhance the biogas potential from your forage.
- Create more methane.

The significant levels of acetic acid produced also prevents reheating at the clamp face at feed out by reducing the growth of undesirable yeasts and moulds.

PASSION AG

## PASSION AG

**Keep out contaminants and moulds while preserving nutrients and energy potential.**

Silage covers play a crucial role in maintaining the quality and quantity of the feedstock used in AD plants, leading to higher biogas yields, reduced operational costs, and improved environmental outcomes.

We stock a wide range of protective silage films, oxygen barriers, protective covers and accessories for secure anaerobic sealing and optimal preservation of energy potential contained in forage.

- Retain quality and improved digestibility for higher biogas yield.
- Reduce top losses by more than 50% compared to standard PE films.
- Keep silage aerobically stable for longer on exposed clamp faces.
- Reduce emissions to the atmosphere and time spent dealing with spoiled or contaminated material.
- High return on investment – Low cost of preserving your feed can lead to less wastage, higher biogas yields, and overall profitability of your AD plant.

# CASE STUDY:
# POWERING UP PRODUCTION

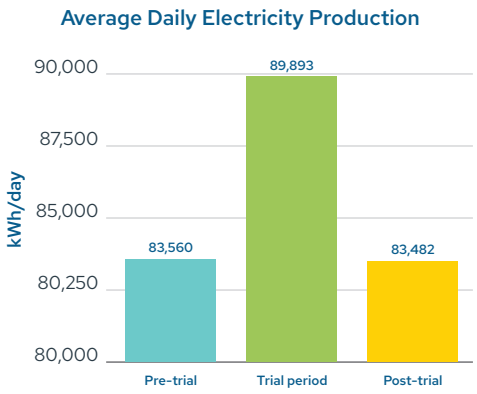
In July 2023, a 4mWe plant in Central Europe trialled **OLIGAS** trace element additives. Their digester produces gas for electricity generation which is fed into the grid on site. The trial was conducted over three months using **OLIGAS** at a cost of around £100 per day.

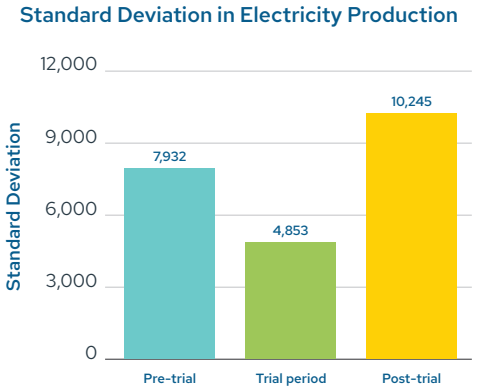
The results were dramatic, with increased electricity production, less day-to-day variation in production, and increased feedstock usage efficiency:

## Increased electricity production:

Output of electricity generated during the trial period averaged over 6,000kWh per day more, or almost 10% higher than the previous three-month period , and fell to the previous production level after the trial was completed..

This equated to around £976 per day at a feed-in-tariff of 15p/kWh, in additional income, or a net benefit of £876 per day, a huge 800% ROI.




## Less variation in day-to-day output:

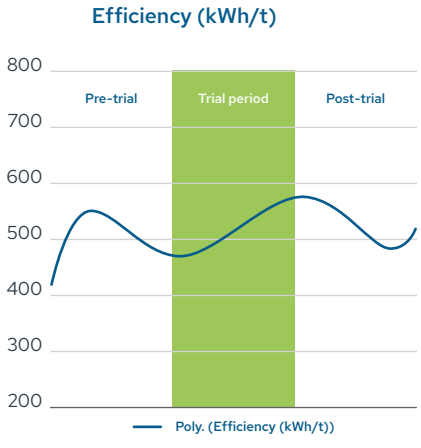
As an additional benefit, energy production was more constant, which is a good indication of stability and efficiency of the digestion process.

More consistent production also supports easier operation, allowing operators to predict the behaviour of the system and make timely adjustments to maintain optimal plant conditions, with less risk of having to flare gas off or shut down due to low gas pressure.

## Increased feedstock usage efficiency:

During the trial, feedstock usage efficiency clearly improved as the trace elements were added. After the trial ended, efficiency remained at a high level then gradually declined as the trace elements became diluted by daily feedstock.

Feedstock use efficiency in the anaerobic digestion process is vital for economic, environmental, and operational reasons. It ensures cost-effective and sustainable operation, maximises biogas production, and contributes to the overall stability and performance of the system.



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